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PART I

Changes in Dietary Intake and Nutritional Status of Onges of Little Andaman

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Shri G. N. V. Brahmam
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Introduction

Tribals constitute about 8 per cent of the country's total population. They are scattered mostly over the hilly regions, and are at various levels of socio-economic development. The Government has accepted area development approach to improve the conditions of the tribals. Special measures like free rations, plantations, wage payments for work on plantations, Primary Health Care on the spot, etc., have been taken up for speedier improvement of certain primitive tribal groups of Andaman and Nicobar Islands. The present study is aimed to assess the infra-structural facilities provided for the settlement of Onges and its impact on their diet and nutritional status.

Background information :

Historically, the Onges belonged to Negrito racial stock and formed a segment of the tribal population groups who were collectively known as Great Andamanese. They in fact were the sole inhabitants of the island of Little Andaman that stretched about 600 Sq. Kms. in the waters of Bay of Bengal. They were nomads and depended entirely on forest produce and wild game for food. They also practised sea fishing but agriculture or horticulture was unknown. Census indicated that their number dwindled from 250 in 1931 to 150 in 1951, 129 in 1961 and 112 in 1971. Their headcount in 1989, at the time of the survey was 98. The main reasons attributed for their demographic decline were : low birth rate due to higher rate of sterility[1] and great disparity in ages of spouse due to a very small population base (resulting in reduction in the number of effective reproductive couples) and a high infant mortality due to hostile and harsh environment and inadequate health facilities. The non-tribals and the Government employees living around their settlements compete with them in hunting the already scarce wild pig and food gathering.

Of late the Andaman administration has taken steps to settle them in two places, one at Dugong Creek (78 Onges) and other at South Bay (20 Onges). Both these settlements have constructed houses. The settlement at Dugong Creek has also got facilities like electricity and dispensary. The services of a Medical Officer, Compounder, an Auxiliary Nurse, Midwife and a Social Worker are made available.

They are supplied with free rations such as rice, wheat flour, pulses, edible oil and other essential commodities like soap, kerosene and clothing, by the administration (Table 1). Coconut plantations have been raised exclusively for them in an area of about 90 acres; 70 acres at Dugong Creek and 20 acres at South Bay.

Math odology

Assessment of Food/Nutrient intake, Clinical and Anthropometric status and Living conditions (in the settlements) formed the main investigations. Weighment method of diet survey was conducted for three consecutive days in about twenty households. The average nutrients intake per consumption unit (C. U.) per day was calculated using food tables[2] and are compared with Recommended Dietary intakes[3].

Antropometric measurements like height, weight, mid upper arm circumference (MUAC), fat fold at triceps (FFT) were recorded on all the available individuals using standard techniques and equipment (Weiner and Lourie, 1969)[4]. All those covered for anthropometry were also examined clinically, for the presence of nutritional deficiency signs. A total of 9[4] individuals were covered for nutritional status.

The dietary and anthropometric data of Onges were compared with the rural population of the main land (NNME 1974—79)[1]. The current data of the Onges was also compared with that of previous survey carried out by NIN in 1969 to assess the changes over a period.

Results

Food and Nutrient intake—Average intake of rice and wheat which formed the staple was 352 g/CU/day, of which rice was 201 g. and wheat 151 g. (Table 2). The intake of pulses, vegetables and milk powder which formed part of their free ration (supplied by the Government) was about 15 g. The total intake of flesh foods, tortoise meat and pork being the major items obtained through hunting was about 180 g. Varing quantities of fresh coconuts (116 g.) and honey (45 g.)were also consumed The intakes of all the nutrients except Protein and Thiamine were below the recommended levels (Table 3).

Over the three day period, there was not much day to day variation in the levels of consumption of foods supplied through ration like cereals, fresh coconuts and oil, while that of flesh foods, which depended on their own efforts of hunting and fishing, showed very wide variation. A reflection of this was seen in the levels of nutrients like proteins (43 g. to 83 g.) and calcium (148 mg. to 572 mg.)

Anthropometry —The mean anthropometric measurements of the Onge adult males and females as compared to the rural Indians (NNMB 1974—79) brought out the following—*(i)* the Onges are shorter, *(ii)* their average body weights are also lower in all the age groups except for 20—29 year males and 30—39 & 40—49 years females and *(iii)* their mean Body Mass Index (BMI) values are higher . Age-wise analysis of data on adults revealed that on an average the younger male Onges (20—30 Yrs.) are taller by 2·7 cms. and heavier by 7·6 Kg. compared to the older (50 Yrs). However, such phenomena was not seen in female Onges (Tables 4—6).

Clinical Status —None of the pre-school children exhibited signs of Protein Energy Malnutrition (Table 7). Five of the 14 school age children, two of the four adolescents and two of the 29 adult females showed signs of conjuctival xerosis, suggestive of Vit. 'A' deficiency. Only one school age child had glossitis, a sign of B-complex deficiency. Thyroid enlargement was seen in one adult female. Fungal infection of skin (teeniasis) was seen in quite a number of individuals (Table 8).

Demographic profile—The Onge population gradually declined over a period of time. The age pyramids of Onges in 1961 and 1989 indicate that the proportion of children under 14 Yrs. of age was smaller (27—30%) as compared to national average (39·6 % with minimal differences between 1951 and 1989 (Table 9).

The proportion of population in the age group of 14—44 Yrs. increased from 30 per cent in 1951 to 48·7 per cent in 1989, being similar to the all India average of 43·1 per cent. The proportion of people above the age of 44 Yrs. decreased from 40 per cent in 1951 to 26·1 per cent in 1989 and is still higher than the all India figure, indicating fewer births and survivals and late deaths in the community. While the females constituted 61·2 per cent of the Onges in 1961, they were reduced to 43·9 per cent in 1989 creating scarcity of the female population.

Discussion

Availability of information at three point period afforded the opportunity to assess the changes in the diet and nutritional situation of the Onges brought about by the various intervention measures taken up by the administration.

The major changes observed in the life style of the Onges, since the fifties has been a shift from nomadic to settled life. As they came in contact with the administration which undertook certain measures like providing health and educational facilities through resident health and social workers, visiting officials and other departmental functionaries, the Onges took to tobacco chewing and alcohol drinking. The income they earned through coconut plantation was paid in cash, thus they were able to spend the money. They changed their dress, men started wearing shirts and trousers and women wrapping sarees around their bodies. However, they tended to maintain their identity as a social group.

The remarkable change that occurred was in their dietary pattern. The staple changed from flesh foods (including sea foods) to cereals like rice and wheat. They did not give up totally their traditional means of hunting, fishing and food gathering. The qualitative and quantitative changes that characterised the diets were.—

The cereals which did not figure in the Onges diet during the sixties 6, 7 are now a consistent commodity of consumption (Table 1). Very high amounts of flesh and sea foods, which characterised their diets earlier are not seen now and the foods like fresh coconut, oil, milk powder and pulses entered their diets regularly which hither to were unknown to Onges. As a result of these changes, the protein intake decreased from 140 g. in 1964 to 127g. in 1969 and 69 g. in 1989 (Table 11). The energy intakes for the corresponding periods increased from 167 K. cal.to 1880 K.cal. and 226 K.cal. The consumption of other nutrients like Calcium, Iron, Vitamin 'A', Thiamine and Riboflavin showed a decrease over the period. Nevertheless the most striking feature of the diet of the Onge, today is the stability of energy intakes and inclusion of diversified food articles in their diet, in contrast to violent fluctuating intakes and sole dependance on flesh food/sea food.

The medicare facility provided to them at the site of settlements, was being utilised by them suggesting their acceptance of the system.

Comparision of anthropometric measurements of adult Onges taken during 1969 (NIN)[6] and now 1989 showed that the adult male, on the average is currently taller by 2 Cms and heavier by 4·5 Kg. than in 1969 (Table 12). Also the present subjects have larger arm circumference and thicker fat fold at triceps. However, the heights and weights of adult women are not different between these periods, though the arm circumference and fat fold at triceps values showed an increase over the years.

The secular changes in heights and weights of adult male Onges, slowing down of infant mortality (Table 13) trends seen from the available records, if any thing point to the fact that the Onges today, are nutritionally better compared to some two decades ago.

Recommendations

Based on the observations, the following recommendations are made for the improvement in Health Nutrition and Socio-economic status of Onges.

Socio-economic and welfare measures

(1) *Pre-school education*—Initiation of a programme with the packages of services (like in ICDS) should be considered since it encompasses Primary Health care, Nutrition and Education of children and mothers. The services of a trained teacher, preferably a female be made available at Dugong Creek to ensure non-formal Pre-school education to the children.

(2) *Adult education*—Functional literacy to the adult members of the community with special reference to make them aware of (*i*) value of various denominations of currency, household goods, (*ii*) importance of health, personal hygiene and environmental sanitation and (*iii*) the ill effects of consumption of tobacco and alcohol should be ensured.

(3) *Income generation*—The absence of exchangeable cash or commodities is bound to make them dependent on doles. Hence activities which can generate income at household level should be provided.

Since the women have lot of spare time, they could be trained and gainfully engaged in skills like basket making, mat weaving, toy making etc., which can be sold in urban markets.

Payment of wages to the Onges who work in the Plantations, should be related to work output. At present every person working in the plantation gets paid the same wages.

Adequate Training and technical help in raising piggeries and poultry should be provided.

Special Health and Nutrition Programmes

(1) *Control and prevention of Anaemia*—Since the iron deficiency anaemia is widely prevalent, a regular supply of iron and folic acid tablets through National Nutritional Anaemia Prophylaxis Programme should be ensured. Also, supply of iron fortified salt in place of ordinary salt could be considered on a priority basis.

(2) *Vitamin 'A' Prophylaxis Programme*—Distribution of massive dose of Vitamin 'A' (200,000 IU) solution should be undertaken for all the children, once every six months.

(3) *Periodic deworming*—Since heavy load of mixed worm infestation has been registered, periodic deworming should be carried out.

(4) *Immunisation*—Immunisation of all children against the childhood infections be ensured.

(5) *Safe drinking water and sanitation*—Steps should be taken to provide safe drinking water and sanitary latrines.

(6) *Health and nutrition education*—The community members should be educated regarding the importance of environmental sanitation and personal hygiene in maintaining good health. Use of audio-visual appliances including video tapes and T. V. in addition to interpersonal communication should be considered.

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TABLE 1

List of Food and Non-Food Items Distributed to Primitive Tribal Groups of Andaman And Nicobar Islands (Per Month/Person Above 8 years of Age)*

Food Items	Quantity	Food Items	Quantity
Rice	5·0 Kg.	Turmeric Powder	50 g
Wheat flour	9·0 Kg.	Coriander Powder	50 g
Pulses	0·5 Kg.	Chilly Powder	50 g
Dalda	0·5 Kg.		
Oil	0·5 Kg.	**Non-Food Items**	
Onions	0·5 Kg.	Tobacco leaves	50 g
Sugar	0·5 Kg.	Bathing soap	1 No.
Salt	0·5 Kg.	Washing soap	1 No.
Tea	0·5 Kg.	Match Box	2 Nos.
Milk Powder	0·5 Kg.	Candles	1 Pkt.
Tamarind	100 Kg.	Kerosene	5 Litres

*For children below 8 years half the quantity is issued

TABLE 2

Average Food Intake (g/CU/DAY) Among Onges

Food Stuffs (g)	Day of survey				R. D. I. (I. C. M. R-1981)
	I day	II day	III day	Average	
	20	14	13		
(1)	(2)	(3)	(4)	(5)	(6)
Rice ..	171	184	261	201	..
Wheat ..	197	147	88	151	..
Total cereals ..	368	331	349	352	460
Pulses ..	22	17	3	15	40
Leafy Vegetables ..	0	0	0	0	40
Other Vegetables ..	12	4	30	15	60
Roots and Tubers ..	29	53	13	31	50
Milk ..	12	22	15	16	150
Oil and Fat ..	11	14	8	11	40
Sugar & Jaggery ..	2	3	2	2	30
Flesh Foods					
Pork ..	60	15	89	55	..
Tortoise ..	110	0	216	109	..
Crab ..	5	0	34	12	..
Fish ..	6	0	2	3	..
Total ..	180	15	339	179	..
Coconut ..	110	111	129	116	..
Honey ..	22	102	22	45	..

Figures in parentheses indicate No. of households surveyed

TABLE 3

Average Consumption of Nutrients (CU/DAY) Among Onges

Nutrients	Day of survey				R. D. I. (I. C. M. R-1981)
	I day	II day	III day	Average	
	20	14	13		
(1)	(2)	(3)	(4)	(5)	(6)
Protein (g) ..	75	43	89	69	55
Calories (K cal) ..	2,254	2,218	2,295	2,263	2,400
Calcium (mg) ..	274	148	672	369	500
Iron (mg) ..	16	12	10	13	24
Vitamin 'A' (mg) ..	42	24	19	29	750
Thiamine (mg) ..	1·44	1·08	1·00	1·24	1·20
Riboflavin (mg) ..	0·78	0·67	0·57	0·60	1·40

Figures in parentheses indicate No. of households surveyed

TABLE 4

Mean Anthropometric Measurements of Onges

Age (years)	Sex	No.	Height (Cm)	Weight (Kg)	Arm Circumference (Cm)	Fat Fold at Triceps (Mm
(1)	(2)	(3)	(4)	(5)	(6)	(7)
<1	Male	3	63·9	4·7	11·3	7·7
	Female	...	..	..	..	..
1+	Male	2	67·9	7·5	13·9	8·1
	Female	..	..	..	..	..
2+	Male	..	..	..	..	..
	Female	1	72·2	7·8	13·0	10·0
3+	Male	1	83·5	10·9	14·8	8·0
	Female	2	81·2	9·7	14·4	10·1
4+	Male	..	..	..	..	..
	Female	..	..	..	..	..
6—9	Male	5	89·2	14·5	15·4	8·4
	Female	5	101·8	14·1	15·4	8·8
10—11	Male	2	110·0	16·1	16·0	7·1
	Female	1	108·1	17·8	16·4	8·2
12—14	Male	2	123·7	22·0	19·8	8·2
	Female	..	..	..	..	..
15—17	Male	..	..	..	..	..
	Female	2	136·6	35·1	21·0	13·8
18—19	Male	1	162·1	37·1	22·4	8·2
	Female	..	..	..	..	..
20—29	Male	6	152·7	51·8	27·0	9·8
	Female	4	139·3	42·0	23·7	15·3
30—39	Male	7	162·2	48·6	26·8	9·6
	Female	7	141·6	46·4	26·6	20·4
40—49	Male	12	151·8	47·7	26·1	7·6
	Female	10	141·5	45·7	26·8	18·4
<50	Male	6	150·3	43·9	25·0	7·0
	Female	8	139·6	40·3	25·4	17·4

TABLE 5

Mean Body-Mass-Index of Onge Adultf compared with Rural Indians

Sex	Age Group (years)	Onges	Rural Indians (NNMB-1980)
(1)	(2)	(3)	(4)
Male	20—30	2·2	1·9
	30—40	2·1	1·9
	40—50	2·0	1·9
	>/50	1·9	1·8
Female	20—30	2·2	1·9
	30—40	2·3	1 8
	40—50	2.3	1·9
	>/50	2·0	1·8

TABLE 6

Mean Anthropometric Measurements of Adult Onges by age

Age Group (years)		n	Height (Cm)	Weight (Kg)	Arm Circum-ference (Cm)	Fat fold at triceps (Mm)
(1)		(2)	(3)	(4)	(5)	(6)
Males	20—30	10	153·0	51·6	26·9	8·6
	30—50	17	161·7	47·8	26·3	7·8
	>/50	8	160·3	43·9	25·0	7·0
Females	20—30	4	139·3	42·0	23·7	15·2
	30—50	18	141 3	45·7	26·7	19·2
	>/50	7	139·7	40·2	25·1	16·8

TABLE 7

Prevalence of Clinical Signs of Nutritional Deficiency among Onges

Age Group		Onges			
		Normal	Con. xerosis	Glossitis	Goitre
(1)	(2)	(3)	(4)	(5)	(6)
Infants ..	3	3	0	0	0
Pre-school children ..	8	8	0	0	0
School age children ..	14	6	8	1	0
Adolescents ..	4	2	2	0	0
Adult Males ..	36	36	0	0	0
Adult Females	29	28	2	0	1

TABLE 8

Prevalence of Morbidity among Onges

Age Group		Onges	
	n	Normal	Taeniasis
(1)	(2)	(3)	(4)
Infants	3	3	0
Pre-school children	6	5	1
School age children	14	14	0
Adolescents	4	4	0
Adult Males	36	29	7
Adult Females	29	26	3

TABLE 9

Percentage distribution of Onges by Age and Sex Over the years

Age Group (years)	1961 (n-129)	1989 (n-98)
(1)	(2)	(3)
<14	30·0	27·2
14 -44	30·0	46·7
>44	40·0	26·1
Sex		
Males	38·8	56·1
Females	61·2	43·9

TABLE 10

Average Food Intake (g/CU/DAY) among Onges Over a Period

Type of survey	Year of survey		
	1964 (Anth. Sur of India) 30 days weighment	1969 (NIN) 24 hours recall	1989 (NIN) 3 days weighment
(1)	(2)	(3)	(4)
Food Stuffs			
Rice	0	0	201
Wheat	0	0	161
Total cereals	0	0	362
Pulses	0	0	16
Leafy Vegetables	0	0	0
Other Vegetables	0	0	16
Roots and Tubers	240	240	31
Milk	0	0	16
Oils and fat	0	0	11
Sugar and Jaggery	0	0	2
Flesh Foods			
Pork	534	465	95
Tortoise	32	25	109
Crab	20	25	39
Fish	220	190	2
Total	806	725	205
Coconut	0	0	116
Honey	15	145	45

TABLE 11

Average Consumption of Nutrients (CU, DAY) among Onges Over a Period

Type of survey	Year of survey		
	1964 (Anth Sur of India) 30 days weighment	1969 (NIN) 24 hours recall	1989 (NIN) 3 days weighment
(1)	(2)	(3)	(4)
Protein (g)	140	127	68
Calories (Kcal)	1,571	1 862	2 283
Calcium (mg)	1,415	1,386	368
Iron (mg)	17	16	13
Vitamin A' (ug)	81	71	29
Thiamine (mg)	2·47	2·25	1·24
Riboflavin (mg)	0·72	0·71	0·60

TABLE 12

Mean Anthropometric Measurements of Adult Onges Over a 20 year Period

Year of survey	No.	Height (Cm)	Weight (Kg)	Arm Circumference (Cm)	Fat fold at triceps (Mm)
(1)	(2)	(3)	(4)	(5)	(6)
Males					
1969	29	149·9	43·2	24·0	6·9
1989	36	151·6	47·7	26·1	7·7
Females					
1969	13	140·4	43·0	24·9	11·7
1989	31	140·4	42·3	25·6	17·6

TABLE 13

Births and Deaths of Infants among Onges Over a Period

Period	Total No. of Births	No of Infant deaths
(1)	(2)	(3)
1976—79	12	4
1980—84	19	NA
1985—89	11	1

N. A. Data not available

Source—Records at Dugong Creek Dispensary

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Nutritional Status of Children (0-3 years) of Kolha, Kharia and Bhuinya Tribes of Orissa.

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ABSTRACT

An attempt has been made to study the weaning of practices and nutritional status of children (0-3 Years) of tribals of Orissa. Maximum (62 per cent) children belonged to low income group (Rs.301 –600 per month). Breast feeding commenced after 2½ days of 3 days of delivery and continued until next pregnancy (41 per cent). Torani (soaked water of cooked rice), sugar candy water, honey etc. were used as prelacteral feeds. After seven months onwards, food supplements like rice cake (100 per cent), sago were given to children up to one year. After that children were on ordinary home prepared diet. The diet of children was deficient in protective nutrients. The average values of weight, height, arm circumference, head circumference, chest circumference of children were less than ICMR standard in both the sexes. 64 per cent children were suffering from malnutrition (30 per cent severe, 34 per cent moderate), 63 per cent children were suffering from anaemia and symptoms of PEM such as Odema (4 per cent), moonface 2%, potbelly (15 per cent), Hair changes (31 per cent) found to be prevalent among all age groups. Ear infection (6 per cent), Eye infection (11 per cent), Cold (22 per cent), scabies (12 per cent), were found to be most common non-nutritional diseases among children.

KEY WORDS :—Tribal, Breast feeding, prelacteral feeds, torani, rice cake, malnutrition, potbelly, scabies, cold.

Orissa is one of the poorest States of India having 70 per cent of the population below poverty line of total population and two-thirds of population is illiterate. In terms of concentration of tribal population, it ranks second and more than 11 per cent of total tribal population of the country is found in Orissa. It homes about 62 different tribal communities. While there is a broad understanding of health and nutrition problems of the general population particularly of urban and rural communities of Orissa, such information on tribal population is meagre. Hence the present investigation conducted to study the nutritional status of children (0–3 years) of Kharia, Bhuinya and Kolha tribes of Orissa.

For the present study two hilly tribal villages named "Baliabua" and "Kathagadia" situated at the borders of Baripada and Mayurbhanj districts of Orissa were selected. One hundred children between (0-3 years) age were selected on the basis of random purposive sampling. A schedule was formulated to elicit the necessary information such as age, socio economic background, infant feeding and weaning practices, etc. The weight of the children were taken with the help of accurate weighing machine and height, arm circumference, head circumference and chest circumference were measured with the help of a measuring tape. The clinical assessment was done with the help of a doctor.

The result of the present investigation revealed an interesting data. Out of 100 children, 50 were males and 50 were females. Maximum number of children were from age-group of 30—36 months. 88 per cent children were belonged to lower income group. It was noted that infants were fed honey just after birth and kept on different liquid diets such as torani (soaked water of cooked rice), sugar candy water (41 per cent) jaggery water, milk from other mother (27 per cent), honey water (18 per cent), etc. up to 2½ days or 3 days. 81 per cent of mother breastfed their babies after 2½ days and 19 per cent after 3 days because they believed that their milk secretion will be decreased and the child will suffer from diarrhoea if they breast fed their babies from the beginning. None of the mothers were aware about the nutritive

value of colostrum. 41 per cent mothers were breast fed their child until next pregnancy starts also observed by Bhat and Dahiya [2] (1985)

Maximum number of children were only on breastmilk up to 7-8 months. Then mothers introduced sugar candy water, biscuits, sago porridge and rice cake prepared out of one handful of rice from 7-8 months onwards. After one year of age, they started giving ordinary home prepared diet i.e, rice, pakhal (Rice soaked in water seasons vegetables, dried fish).

Nutritive value of the foods taken by the children of 0—6 months age-group was found to be adequate in calories but deficient in protein and other protective nutrients whereas diet of the children from 6 months to 3 years was found to be sufficient in proteins but deficient in calories and other protective nutrients as also observed by Bust[3] et al (1987)

The mean weight of boys and girls of the present study were less than the ICMR standard. The percentage of mean weights of boys and girls of 0—12 months age to ICMR standard was very less i.e., 78·19 per cent and 89·2 per cent respectively

The height of boys were 88·9 to 92 per cent and the height of the girls were 88·3 to 96·13 of ICMR standard

The percentage of mid-arm circumference of boys were moderate in comparision to Wolanak standard up to the age of 18 months, but after that it suddenly decreased. In case of girls the percentage of mid-arm circumference to Wolanski standard was very less in the beginning, then it gradually increased

The mean head circumference of boys were slightly below the ICMR standard i.e., 86[1] per cent to 88·5 per cent of ICMR standard

The mean chest circumference of boys and girls were slightly less than ICMR standard up to 12 months of age i.e., 99·08 per cent and 98·82 per cent respectively but after that both boys and girls were having better mean chest circumference as compared to CMR standard is also observed by Gopaldas [4] (1987)

Weight for height ratios of the children revealed that 30 per cent of children were suffering from severe malnutrition and 34 per cent children were suffering from moderate degrees of malnutrition. That means 64 per cent of children were suffering from malnutrition and 36 per cent children were found to be normal also supported by Gopaldas [5] (1987).

Data on clinical assessment of children revealed that 37 per cent children were normal whereas 63 per cent children were suffering from different types of nutritional, non-nutritional and infectious diseases. Cases of vitamin-B Complex deficiency was very less. One per cent children were suffering from spongy gum and 2 per cent in Angular stomatitis and chiloasis. 63 per cent children were suffering from anaemia. 11 per cent, 8 per cent, 22 per cent, and 12 per cent children were suffering from eye infection, ear infection, cold and scabies respectively. This is mainly due to unhygienic environmental condition and chilled water of hill as observed by Goyal [1] et al (1987)

Poverty, ingnorance, illiteracy, unhygienic environmental conditions, limited seasonal availability of foods were found to be the major factors affecting the nutritional status of the children. Therefore, there is an immense need for Government aid, transport facilities and nutrition education for the upliftment of these tribals

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PART II

SEMINAR PAPER AND MINUTES OF DISCUSSION

TRIBES AND THE FOREST—
An Overview

Dr. N K. Behura

"A crucial distinguishing feature of the tribal society is their association with a territory to which they belong and command over which is sanctified by their tradition. The first blow to this ingrained belief came with the reservation of forests in the name of scientific management by the colonial rulers but with an eye on its exploitation for purposes of revenue" (Sharma, 1988-87 20) Its impact was somehow tolerable since at that time the ratio of resources to the population was high and the demand on forest was less. By and large tribal regions were outside the pale of administration, and certain rights of the tribals were recognised as a part of the process of reservation, which continued for a long time without much interference Thus the association of tribals with the forest goes back to the hoary past Tribals are known to others as forest dwellers

To day, the exact number of persons living in forests or primarily dependent on forest is known Neither the proportion of tribals among such population is also known. It can be assumed that the major bulk of the permanent residents in the forests, except in parts of Western Himalaya, are tribals. From available ethnographic accounts it is known that the major bulk of Scheduled Tribe population in India are tribals, who depend on forests in varying degrees for their livelihood. It is needless to say that forest constitutes the important nexus in their socio-cultural life Therefore, it is obvious that economic and social well being of tribals cannot be ensured ignoring their dependency on the forests and the forest eco system An interference in the relationship of the tribals with the forest goes back to the policy of large scale exploitation of forest resources, which was introduced in early 19th century in the interest of State sponsored capitalist enterprises such as railways, shipping and tele-communication. But this was not compensated by any significant investment for augmentation of production of housing materials, such as, timber, fuel wood, fodder, reeds, etc

The forest policy of 1894 stated that the management and preservation of a forest involved: (*i*) regulation rights over it, and (*ii*) restriction on its uses by the neighbouring population Further the Act stipulated that the forests on hill slopes be maintained as protected forests, others which were reservoirs of precious timber should be managed on commercial lines for augmentation of State revenue, and the forests that yielded timber, fuel wood and fodder should be managed mainly in the interest of the local population. But in reality there had been attempts to black-slide from this policy whenever situations permitted Administration did not take any clear cut position in this matter

This national forest policy was revised after Independence, that is, in 1962. Under this exercise, the privileges granted to the forest dwellers in 1894 were converted into

certain concessions. It proposed a classification of forests on a functional basis, such as (*i*) protection forests, (*ii*) national forests, (*iii*) village forests, and (*iv*) tree lands. And emphasis was laid on (*a*) weaning the shifting cultivators, by persuasion from the pernicious practice, (*b*) restricting grazing in the forest (*c*) promoting welfare of the people, and (*d*) increasing efficiency of forest administration by having adequate forest laws

The essence of 1952 forest policy was reiteration of bureaucratic management of forests and promotion of state capitalism in the forest sector. Roy Burman is of the view that 'much of the uneasy political situation that have prevailed in the hills in the post-independence period are related to this policy (1980:4)

In early 70's the National Commission on Agriculture (NCA) suggested a revised forest policy based on the following points :—

(*i*) Management of the forest resources of the country should be done in a manner to provide maximum goods and services for the well being of the people and thereby ensure economic progress of the country

(*ii*) Checking denudation and erosion in mountainous regions and catchment areas of rivers through plantations

(*iii*) Preventing soil erosion along treeless banks of rivers and vast stretches of waste lands

(*iv*) Maximization of forest productivity with a view to meeting the growing demand for domestic, defence and industrial requirements, with the ultimate aim to ensure national prosperity

(*v*) Provision of small timber and fuel wood for the rural masses.

(*vi*) Permission for grazing of livestock in forest areas notwithstanding any harm to the forest

(*vii*) Creation of recreational and tourist opportunities in the forests, and

(*viii*) Creation of blocks of forests interspersed with cultivation or introduction of trees in large numbers for maintaining a harmonious relationship between soil, vegetation and animal life.

These objectives stood for short and medium range policy matters and programmes, but did not touch the question of traditional rights of the tribal communities in respect of forests. However, it has made a passing reference with regard to employment in forest activities, for example, it has suggested that employment could be offered as an alternative to the right of the users, if forest development is properly planned. But the fact remains that the NCA ignored the realities about forests and tribal life.

Forests and tribal life in many parts of the country are inseparable. "In many parts of the country communal ownership of forest and other resources prevail among the tribal communities. While in some areas such communal rights are specifically recognised under the provisions of the statute, in others the State maintains an ambiguous attitude in respect of them" (Roy Burman 1980 8). Tribal social structures are always oriented towards the collectivity. They have an in-built system of taking collective decisions about protection, use and allocation of native resources that is, land, forest, water, animals and birds.

Conversion of corporate rights of tribals on forest resources into a pool of wage-labour has pushed the tribals to a position of dependency. It has shattered their solidarity. Forest promoted an egalitarian and solid social order among the forest-based tribal communities. The forest policy enunciated by the NCA in a way militates against the equalitarian values and social structure of tribal communities.

It has been ascertained by researchers that neither development of commercial forestry nor forest based industry has generated enough employment for absorption of the workers among the forest dwellers. Therefore, the position taken by the NCA in respect of the accrual of the economic benefit to the tribals in view of the termination of their traditional rights on forests is not tenable. Its attitude towards the forest dwellers is evident in its statement which reads thus : "Free supply of forest produce to the rural population and their rights and privileges have brought destruction to the forests and so it is necessary to reverse the process. The rural people have not contributed much towards the maintenance or generation of the forests. Having over-exploited the resources, they cannot at all fairness expect

that somebody else taken the trouble of proving them with forest produce free of charge. One of the principal objectives of social forestry is to make it possible to meet these needs in full from readily accessible areas and thereby lighten the burden on production forestry such needs should be met by farm forestry, extension forests and degraded forests"

It may be presumed that the NCA envisaged social forestry not as the core of forestry development programme but as supplementa There are two distinct elements in the approach of the NCA to the question of forestry namely, (*i*) distrust of the forest-dwellers and holding them mainly responsible for the degradation of forests, and (*ii*) maximization of revenue as the main incentive of production forestry

Notwithstanding the recommendations of the NCA, the conference of State Forest Ministers and Ministers for Tribal Welfare held in July 1978 resolved that the development of forests instead of being planned in isolation should integrated with the development of the tribals. They proposed that (*i*) the forest departments should constitute tribal labour co-operatives, with a time-bound programme to undertake all forestry operations replacing intermediaries (*ii*) the right of collection of minor forest produce be done by the tribals and a remunerative price be ensure to them , (*iii*) and the forest villages be abolished and converted into revenue villages

This approach presents a compromise package between the first and second models of forest development But it is to be considered that in view of the growing tribal consciousness whether this model is enough to solve the problems faced by the forest-based tribals Therefore in view of the economic miseries of the forest-based tribals and in view of the environmenta hazards it is desirable to synthesize the second and the third approaches, because forests cannot be preserved and developed without the co-operation of forest-dwelling tribes.

The development planning of the forests need be broad based. It must encompass the participation of the people who have been living in and around forests for centuries Ethnographic studies have documented the existence of beliefs and practices, among the tribal communities, relating to the replenishment of plant and animal species in their forest environment and about soil and water management These are based on age-old experience and wisdom

In recognition of the essentia needs of the population for various forest produce 'social forestry' was instituted during the Fifth Five-Year Plan. This has been reflected in the classification of forests by N C A., namely protection forestry, production forestry and social forestry A people oriented forest policy should not treat only the 'Commercial Forestry' as 'Production Forestry' and 'Socia Forestry' as something ancillary This presents a distorted orientation to the personnel of forest management

The fund allocated to social forestry during the Fifth Plan period was round about one per cent of the total outlay in the forestry sector, and this amount covered not only the expenditure incurred on plantation, but also the expenditure for creation of game sanctuaries The figures of exact allocation of funds during the Sixth and Seventh Plan periods are not ready at hand, but there are no indications of massive investment either

There is a lacuna in the conceptualization of social forestry The NCA has defined the scope of 'social forestry to include farm forestry', 'extension forestry, reforestation of degraded forests and recreation forestry' This sort of diversification of the activities of social forestry is bound to detract it from the most pressing task of adopting a crash programme for augmentation of fuel wood and fodder species

Social forestry has made some headway over the year But it is still in a nascent stage It does not comprehensively cater to the needs of the tribals. There is hardly any research for the technological improvement of social forestry in view of people's socio-economic needs. Such research should be related to the plant community and to flora-fauna symbiotic relationship, in the context of human needs in an eco-system

A viable social forestry should constitute the cardinal ingredient of national forest policy in which high priority will have to be given to the development of minor forest products Ethnographic accounts indicate that minor forest products yield 10 to 60 per cent of the income of tribal households. Data collected by the Tribal Development Wing of the Home Ministry show that out of 21,000 botanical

species reported from forest areas, so far only about 3,000 species have been identified to have commercial value.

In spite of the growing recognition of the importance of social forestry and minor forest produce, it is the commercial forestry which holds the prime of place in the forestry sector. Its management culture has to articulate with the positive aspects of people's culture in the larger interest of the nation. Culture of the people can also contribute to the growth and management of forests. A prevailing notion is that the production and extraction decisions are fully scientific and technical ones, but a closer probe shows that these are not precisely so, because alternative production schedules are possible on the same lands which the people know. In some areas the people themselves are having a feeling that extraction of plant species has political fall out. Apart from whatever technical advantage it may have, in the forest belt of Chotanagpur and Madhya Pradesh replacement of Sal forest by teak or pine, means that rights of the tribals to collect Sal leaves and undergrowth are automatically abolished. The Sal has ritual value for several Mundari group of tribal communities, and therefore, removal of Sal trees means interference in their cultural practices. The tribal communities of Chotanagpur are agitating against the replacement of Sal by teak. In Madhya Pradesh and Maharastra there are similar protests. Therefore, for smooth implementation of the plans, people's co-operation has to be mobilised. There should be a forest advisory committee at the division and range levels in order to make the forest management system broad-based. This can resolve the basic question of the termination of people's customary rights and generation of employment for the deprived ones.

The conference of State Ministers for Forest and Tribal Welfare held in Delhi during 1978 has done a commendable job recognizing the right of the tribals to collect minor forest produce in order to supplement their income. This does not seem to be adequate. Therefore, whatever employment potential is generated in the forestry sector that must fully benefit the indigenous and tribal population. It is observed that frequently migrant labour is recruited for the purpose. This is bound to happen if the sole objective is profit maximization. The human factor has to be given the importance it deserves. From this view point the new national forest policy must be based on a comprehensive national appraisal. The simple economies of the tribal communities are under pressure both internal and external, and there are no new avenues open to the tribals which could relieve the same. The accrual of economic benefits of forestry operations to the tribal people has been limited to what could be earned by them as wages. This was true not only in the working of forests but also in the collection of the minor forest produce (MFP) over which a special claim of theirs had been formally conceded. In this respect the Commissioner for Scheduled Castes and Scheduled Tribes in his twenty-eighth report writes "workers' participation is a cherished goal not only in management but even in ownership of enterprises in which the membership of individual worker is a matter of choice and the capital is subscribed nationally. The tribal people, on the other hand "have not been considered worthy of any status higher than that of casual wage-earners in forestry unmindful of their claims for exclusive command over the same" (1987 21).

And in the same breath the Commissioner makes a sombre observation. His statement reads thus: "Even the right of the tribal people to collect the MFP, which was duly recognized at the time of reservation of forests, has not been honoured in its true spirit. With the passage of time what was conceded as a right became a concession and now we are at a stage where even these concessions are not easily conceded and are being virtually treated as unnecessary encumbrances. The price which the tribal gets for MFP even in purchase by State agencies represented the return for his labour-input for collecting the item and not the value of a product over which he has a right. Since the right to collect the MFP was conceded to the tribal people living in the forests and deriving their sustenances therefrom, as a part of the process of reservation of forests, it cannot be abrogated as has happened in practice, as the States are levying royalties on the MFP and the tribal is getting just the wage for collection plus something, if at all, *ex gratia*" (1987 , 21). And the Commissioner makes bold assertion that , "The State has no right to levy royalty on a produce over which the tribal people had been given a right even though the circumstances may have changed and the produce may have become more valuable because of its diverse use and the

extension of market economy in tribal areas' (1987 21) In the development process denying the tribals the benefits of the changing situation is unfair, because the gains to the tribal people from forest economy is not only limited but also inconsequential even at the sustenance level

The tangled issue of forest lands has not been solved although efforts have been made from time to time The reason being that the reservation of forests was done in many cases in an arbitrary fashion and the people were not given a chance to present their case Of course there has been a lot of rethinking over the Forest Conservation Act of 1980 The tribals should not be treated as a trespasser and be evicted He finds himself in a helpless situation. He must be provided with suitable alternatives for sustenance Today there is large scale migration of tribals to industrial and urban areas for earning a base livelihood In order to reverse this trend Social Forestry Programme has to be made a people's programme with governments' participation rather than the same being a government's programme with people's participation.

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PODU : An Ecological Hazard

*Dr C. R. Mohapatra

Orissa is mainly an agrarian State with 80 per cent of its population living in villages. The way of life, the culture, the arts and the crafts and the occupation of the bulk of the people lean heavily on forestry and innumerable products derived therefrom. This very dependence makes forests invaluable for the people in India. Heavy pressures of human and cattle population have led to the disappearance of forests from densely populated areas. The biggest single demand that the community places on forests is for fuelwood. This demand is estimated to be nearly 150 million tonnes while the recorded production of fuelwood is nearly 16 million tonnes. Owing to great shortage of fuelwood and in the absence of alternative sources of energy, cowdung which is a good and cheap manure is burnt as fuel. The diversion of cowdung from the field to the hearth has led to poor agricultural yields. Besides fuelwood, the forests have to provide fodder for cattle, wood for house construction and agricultural implements and gainful employment to the rural population. The disappearance of forests from rural areas has brought about a crisis in rural economy.

The Forest of Orissa is the abode of the 62 different tribes speaking 25 different tribal languages. The tribal population in State are more than 25 lakhs, about 25 per cent of the total population of the State. Juanga, Gadaba, Paraja Bonda, Didayi, Koya Binjhia, Bhumija Saoras, Kondh, Bhuyan, Gond are some of the important groups of tribals. Many tribals speak Oriya with local dialectical variations. None of the tribal languages referred to above belong to two linguistic families namely Mundari group of the Austro-Asiatic sub-family and the South Dravidian, sub-group of the Dravidian family of languages. Amongst the tribals 61 per cent are engaged as cultivators, 21 per cent agricultural labourers, 18 per cent get themselves engaged in Forestry, Mining, Fishing and hunting, etc. Rests are engaged in miscellaneous profession. Hunting for the tribals of Orissa is more of a sport and cultural pastime than a source of income ceremonial hunting marks the communal feeling of the tribals. With the progressive diminution of forest and restrictions enforced by law the tribals seldom go on hunting expedition. From the economic point of view the tribals of Orissa may be classified under three categories. First type, the Kharias who are semi-nomadic work out their living mainly by collection of honey, roots and tubers, silk cocoons and other forest produce. The second type are Hill Juangas, Peuri Bhuiyans, Kuna Kondhas and Lanjia Saoras practise shifting cultivation (Podu) and supplement their economy by food collection. The third type is the settled cultivators, agriculturists. The tribals in different economic stages also exhibit varying stages of cultural development.

Podu cultivation is also known as "Uhum" or shifting cultivation. It has got its wide extension all over Asia. This podu cultivation can be identified as (*i*) Active, (*ii*) Dormant or pseudo active and (*iii*) Extinct.

Normally though people call the practice of Podu as shifting cultivation yet I would call it as "Rotating cultivation". The process of

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"shifting" is only a temporary action because after a lapse of 6 to 10 years period the tribals again resume the cultivation they left over. Thus, the cultivation goes on in a cyclic manner with variable time gap. One appreciates the strong understanding amongst the tribals as hardly there is any dispute for encroachment or unrecognised authority of ownership on a piece of land. As regards to the classification of Active-Dormant-Extinct, the area where podu cultivation is continuing at present may be classified under the category "Active". The second category of land is under rest and is awaiting cultivation after a lapse of few years. But the land under third category is the gone case where no further cultivation can be taken up.

What do they do ? The tribals either make a clear felling of a particular patch of forest burn the vegetative growth and then start hoeing operation before sowing of their agricultural crop or at times they girdle the trees for a natural death of the trees after which the operation of felling and burning becomes easier for them. Continuously for three years the tribals carry on cultivation thereafter they shift to another patch. But, again after an interval of 10/12 years depending upon the availability of forest area they come back to the left over area and re-do the past operation. Hence during the lean period when there is no ongoing activity the 'Podu area' remains almost "dormant". But due to repeated cultivation i.e., unscientific way of disturbing the soil, there occurs soil erosion resulting in exposure of either parent rock or the soil does not possess any fertility due to which the area is left over further to be eroded. This type of area is classified as Extinct.

Causes—Practising of podu cultivation is not an abnormal practice. It is the normal human instinct and the desire to survive. The only negative factor attributed is the "primitive method". The practising of "podu" can be differentiated further as absolute-induced and accused.

(*i*) Absolute—under this category the tribals carry on the practice as an age old tradition.

(*ii*) Induced—The outside unscrupulous money lender volunteer to lend money to the tribals and induce them to carry on with an understanding, take a lion share of the produce as "interest". The outstanding capital remains as heavy burden on the tribals and also ultimately engages the tribals as 'bonded labourer'.

(*iii*) Accused—under this category some of the anti-social elements exercise their unauthorised influence to lure the Adivasis with a false hope to record the land in the name of the cultivators. But ultimately the cultivator is being accused as an offenders.

The cumulative effect of Podu cultivation can not be quantified in monetary terms. It has done harm to foresters, to agriculturists, to biologists, to many others. In totality it has changed our 'Environment'. The depletion of vegetation has had its impact both on micro flora, fauna and climate.

This malady of Podu cultivation is an age old practice. It started with the birth of human race. It continued and may continue for years to come. It can not be stopped. But the intelligensia who express concern about the deterioration of our environment should think and act to arrest the process if not stop it. Its not a problem confined only to a few specific department of the Government organisation. The people who are the real beneficiaries need to be motivated and their active and sustained interest has got to be ensured. These requirements call for the establishment of new institutions and the adoption of a relevant forestry technology. An effective forestry extension organisation is very necessary to propagate the idea of community forestry and to convince the villagers that their welfare is intimately linked with it. This is not an easy task. The extension personnel should have sound knowledge of socio-economic problems of the community and of human behaviours. The present forestry organisations in the States are deficient in this respect. Realising their short comings extension courses for forest officers drafted for implementing these programmes are being organised with the help of Agricultural Universities.

Motivation of the rural masses is the most important single factor in determining the success of such a programme. Long gestation period of forestry programmes is an important handicap in obtaining people's participation.

A programme of reafforestation combined with wood gasification will restore agriculture to its original place as the base of all subsequent transformation activity in the economy. In particular, it will largely replace fossil fuels as the sources of highly concentrated forms of energy. As a result, a large part of the enormous increased in productivity that are taking place in industry will be funnelled back directly into the rural areas, where four out of five people live.

Perhaps the most attractive feature of a development strategy based on reafforestation is that its implementation requires no radical shift in the patterns of investment that has been pursued in the country so far. For instance, while it will profoundly alter the energy base of the economy, it will require no change in the industrial "Superstructure" that has been built on it.

Since synthetic gas (carbon monoxide and hydrogen), the basic product of wood gasification can meet each and every need of the petrochemicals industry even more easily than natural gas, non of the petrochemicals plants that are now being built all over the country will be rendered obsolete. What is more since all the end products of this industry will remain available even when oil finally runs out no change in life styles will be called for.

There is no need to create new institution to finance social forestry loans. The banking system both commercial and co-operative banks can do this by hypothecating the standing tree crop and relating the annual advance to the number of trees still standing (in practice it is most unlikely that many will die after the first year or two of life). The reluctance that many banks feel about loans against standing crops, even of a non perishable kind like trees, can be overcome by setting up a refinance or guarantee corporation to under write such loans. In fact the newly created NABARD (National Apex bank for Agriculture and Rural Development) is already underwriting loans for forestry, but only those given to institutions and not to inviduals. It is therefore only a tiny steps away from the desired goal of becoming a full fledged refinancing corporation for Forest Development. Shortening the gestation period can help in ensuring their interest and participation. In traditional forestry, the benefits start accruing only at the thinning stage which may take 5 to 10 years. Such species as can ensure returns in 2 or 3 years have now been selected for community forestry programmes. This approach has paid a rich dividend in many areas where willing co-operation of the people has been ensured. Besides this the decision that the revenue accruing from the rural forestry programmes would be shared with the rural community based on the recommendation of the national commission on Agriculture has also been very helpful.

Afforestation and plantation programmes assume great importance to enrich the forest wealth of the State and to cater to the demands of small timber as well as firewood requirements of the State. There are number of hydroelectric projects and irrigation projects. It is necessary to give an adequate vegetative cover to the catchment areas of these projects in order to control soil erosion and arrest the rapid siltation of the reservoirs. Large areas of the forest land have been denuded due to the extensive practice of shifting cultivation. All these factors demand greater attention to the afforestation and deforestation programmes.

The involvement of the people has to be right from the formulation stage of these programmes and should also be a sustained one. The programmes are required to be formulated in consultation with the people. The beginning is made by holding dialogues with the local leaders. They are to be explained that these programmes are being executed for their welfare and all the benefits will accrue to them. Extension wings have been created in Forest Departments of some states for this purpose.

The implementation of the forestry for the people programmes requires a strong research backing. Some of the problems requiring research investigations are the interaction of trees and agricultural crops, the role of trees in ecological balance of the region, selection of suitable species for different agro-climatic and edaphic zones, selection and breeding of fast growing and superior genotypes, collection processing and marketing of different products to be obtained from community forestry and research in extension methods. Research on some of these problems has been initiated at some agricultural universities and research centres of the Forest Research Institute.

In view of the overwhelming dependence of the rura community in general and of the tribals in particu ar on the forests and forest products, the interaction between communities and forests is pronounced Briefly stated, the stability of the rura community in turn depends upon proper ma ntenance of the forests. Unfortunately in this country the forests have not been well treated by the rural communities which have been meeting their basic forest-based needs without any thought to forest replenishment or whether the forest can meet these requirements in perpetuity The consequence has been the widespread destruction of forests all over the country To ensure peoples participation a new approach totally different from the traditional ones need to be adopted. It needs scientists, sociologist, politicians and Elites of the society to sit together and plan out plausible solutions to the problems. During last 40 years under different tribal development schemes attempts have been made to improve upon their socio-economic condition Permanent settlement i. e Housing schemes and provision of cultivable land were made to bring them down the hills. Improved varieties of cattle were supplied to the adivasis Tra ning was arranged for the youth to take up different types of vocation Attempts do continue to improve upon their health and hygiene

When there is scarcity of cultivable land can we implement a land consolidation system and distribute for their permanent cultivation ? Will they accept it ? Who will implement— they by themselves or through Government or semi-Government media ? Fuelwood scarcity has stood as a grave problem for all common man who depend upon the tribals to collect firewood for them Thus, can we stop illicit fellings ? Evil effects of podu cultivation should be taught to the forest dwellers. Can they be taught in a befitting manner ? Who will teach them our literacy percentage as a whole in the State stands at 34%. Many schemes and projects have been taken up in the tribal areas why did they not make appreciable impact on their development ? These are some of the burning thoughts which should be dealt in detail and action 'plan be prepared as remedial measures It is thought provoking, why not let the stream flow its own course. Thereby, I do not suggest to encourage further shifting cultivation. I do visualise only a corrective method to keep the flow of the stream within its two banks. The idea is only a symbiosis. Forestry and continuance of shifting cultivation is proposed to be taken up in parallel lines My little experience shows that through Agro silvicultural method it had been possible to persuade the adivasis gradually to change their mind. It is difficult for the podu cultivators to leave their 'profession", to shed off the superstition, the age old tradition imbedded to their life style. It would be a blunder on the part of the civilized city dwelling brothers to erode the habits, the habitants particularly the rich heritage of their culture We may try to educate them, provide better amenities and comforts to enjoy a better living condition, but not at the cost of their own identity Seldom an Indian can adopt the philosophy and life style of an European Because an Indian is an Indian born and brought up under a different environment, having the variable components such as weather, food habits, different tradition and religious philosophy Thus, a forest dweller can not be converted to urbanisation. Everything, that requires to stop the practice of shifting cultivation and change the mind of the beneficiary is a devoted and dedicated machinery that will act in a concentrated manner instead of a diffused action In the words of Shri Kuldip Nayar "Seminars are as a ruled dull Their very nature makes them so. The only speeches are the inaugural and valedictory ones. The rest of the time is taken by papers, which are read. The most impact any paper can aspire to create is to be described lively"

Rainfed Farming in Tribal Areas for Environmental and Food Security

Shri Dibakar Sahu

A. What is rainfed farming :

Farming which is undertaken based entirely on rainfall. The difference between rainfed farming and dry farming is that rainfed farming is practised in areas irrespective of receiving low or high rainfall, whereas dry farming is practised in low rainfall areas. In low rainfall area (dry farming area) moisture conservation is of prime importance whereas in rainfed farming, in addition to moisture conservation, water management which may include safe disposal of excess rainfall is also taken into consideration. In both rainfed farming and dry farming water harvesting is a major component in water and land management. Water harvesting refers to storing of surplus water of an area and utilize the same *insitu* and / or bringing the same to other areas where it is necessary for different uses like crop production, domestic use etc. For example, we may construct a diversion ditch to drain off the top barren slope and spread the water in cultivated field below. Water harvesting is achieved by digging of ponds for storing surplus water for light irrigation We can have gully plugs on the nallahs and divert their water through a spill channel to adjoining land. Diversion weirs are also constructed across streams and nallahs and water is diverted to adjoining fields or water is taken to fields away from the field through a graded channel

The difference between irrigation and water harvesting is that irrigation is done to fields with standing crop i.e. period between sowing and harvesting of a crop while water harvesting is the process of storing water in the fields when crop may or may not be there The aim irrigation is to water the crops and water harvesting is to water the soil. Soil is the store house of water in its voids. By water harvesting depleted ground water is recharged. moisture regime of soil is improved and above all a healthy environment is created

Under very arid conditions reducing runoff and increasing infiltration rate are ineffective as the amount of moisture that can be stored in the soil do not suffice for crop production. Therefore it is better to increase runoff and reduce infiltration in certain areas which can then serve as a source of water-supply for other areas

B Global Water Budget:

Our planet contains 336 million cubic miles of water However nearly 95 per cent of this prodigious supply is salt water contained in the oceans and seas which cover two-third earth a surface Of the balance 5 per cent that is fresh water 4 per cent is frozen in polar ice caps of vast glaciers. The remaining 1 per cent or 3 36 million cubic miles which is at least theoritically available for human use is distributed approximately as follows :—

Ground water	98·55 %
Lakes	1·00 %
Soil (between particles)	0·20 %
Rivers and streams	0·10 %
Atmospheric vapour	0·10 %
Biological (in plant and animals)	0·05 %
	100·00 %

If fresh water supplies were uncontaminated and equally and evenly distributed through space and time around the globe there will be little need for water development and management projects. But observations tell us that water-supplies are neither evenly distributed nor uncontaminated.

C. India's Water Budget :

On an average India receives an annual rainfall of 112 cms. or 370 million ha. m. Out of this 120 m. ha. m. are lost as evaporation and 80 m. ha.m. seep into the soil and about 170 m. ha.m. flow into rivers. Out of 80 m. h. m. of water that seep down annually into the soil about 43 m. h. m. remain in the top layers and contribute to the soil moisture which is essential for growth of vegetation. The remaining 37 m. ha m percolate down and represent the annual enrichment of ground water. It is roughly estimated that out of 37 m. ha.m. an amount of 27.05 ha.m. is available per year for ground water recharge, the balance is lost as evaporation.

All the 170 m. ha.m. of runoff in our rivers cannot be harnessed due to limitations imposed by topography, flow characteristics, climate and soil conditions. As the rainy season flows cannot be fully utilised during the four months of June, July, August and September Indian has resorted to construction of large, medium and minor irrigation projects. Suitable sites for construction of dams are limited. The result is that flow in major rivers cannot be harnessed fully. Paucity of arable land in some river basins is another reason for non-utilisation of the runoff. As for example Brahmaputra valley in Assam is narrow having a mean width of about 90 km. For the enormous size of the river there is not enough land in the valley to utilise the water flowing in the river. As far as rivers originating in the Western Ghats and flowing westwards are concerned, because of their short length to size they offer very limited scope for harnessing runoff for development of irrigation.

From the above analysis of India's water resources, it appears that we are endowed with large quantities of water but never the less it is not unlimited. In the long run it will not be sufficient to meet the requirements of agriculture, industry, safe drinking water etc unless its judicious and economic uses are ensured. Further it is to be remembered that the rainfall as well as its potentialities are ill distributed through time and space resulting in severe arid conditions in some areas as well as humid conditions in other areas during the same period of the year. The ill distribution causes flood during one part of the year followed by long drought spells.

D. Average residence of Water

The following table indicates the average residence of water on the earth

1.	Atmosphere	.. 10 days
2.	Oceans	.. 3,600 Years.
3.	Polarice	.. 16,000 Years.
4.	Terrestrial Water	
	(a) Rivers	2 weeks
	(b) Lakes	10 weeks
	(c) Soils	2-50 weeks
	(d) Biota	1-20 days
	(e) Ground water	1-10,000 Years

Among the terrestrial waters soil water is most important for us. If we can increase the residence of water in soil by few weeks more we will be able to reduce effect of drought, flood and improve our environment etc. Here comes the role of Drought Prone Area Programme which aims are reducing the effects of drought by judicious use of water in Drought Prone Areas.

E Dryland Agriculture as Environmental Plan

Today the term ecology and environment often are used interchangeably, but they are not the same. Ecology is the study of the relationships and interactions of the living and non-living parts of our surroundings. The living parts include plants, animals and micro-organisms while weather soil, rocks, energy, topography and water are some of the non-living elements in our surroundings. Environment can be used interchangeably with surroundings inclusive of all living and non-living parts (includes man and the Social and Cultural activities associated.

The Energy flow and Ecosystem—Energy is an important common denominator in all ecosystems whether designed by nature of man. The source and quantity of energy determines to a greater or lesser degree the kinds and number of Organisms and the pattern of developmental processes, not to mention the life-style of man. Our

ecosystem rely on two major sources of energy, the sun and chemicals (or nuclear) fuels. We can conveniently distinguish between solar powered and fuel powered systems on the basis of the major inputs. It is important to note that although the total solar energy impinging upon the earth is enormous, solar radiation on an area basis is a dilute energy source, because only a small portion falls on a square metre is directly useable by organisms. In contrast fuel may provide a highly concentrated source in terms of conversion to useful work within a small area. In fuel powered ecosystem or urban industrial system, highly concentrated potential energy of fuel replaces solar energy. As cities and urban areas are now managed, solar energy is not only unused within the city itself, but it becomes a costly nuisance by heating up the concrete. Food,a product of solar powered system is here considered to be an externality since it is largely imported from outside the city. Thus a hectare of a city requires not only many hectares of agroforest ecosystem to feed it, even more hectares for general life support to take care of carbon dioxide and other large volumes of wastes and to supply it with large volumes of water and other material. Richer the city in terms of energy use, the greater the area of life support that is required. The propagation of unsustainable lifestyles by the rich city dwellers and inability of the poor to meet his needs of fuel, fodder, water food etc. are factors that have contributed to the general environmental decline. In each village level or miniature or microlevel a malady remedy analysis indicating the factors that cause environmental degradation should be done. This can be best undertaken by local non-governmental associations. The most pathetic part of it is that the city dweller is not aware of it or does not care for it. He has conveniently forgotten that the water he uses comes from the watershed above, the fuel or timber he needs comes from upper catchments (dry or rainfed) and so on. The city is not concerned what is happening to the areas which provide all life support system to the cities. Among many of the pernicious acts prevelant in the upper catchments are the practice of unscientific dryland agriculture which destroys the life support system through deforestation, drought, flood, erosion and degradation around.

(b) Leaf Area Index (LAI)—The area of one side of leaves per unit area of land surfaces. This is the best measure of capacity of a crop for producing dry matter. This is called the productive capital. After germination LAI increases very slowly at first then follows a period of rapid expansion. LAI increases light absorption and the rate of dry matter production until the foliage becomes sufficiently dense to cause mutual shading. Then less light penetrates lower leaves whose photo-synthetic activity is therefore reduced. As shaded leaves respire as actively as leaves receiving full light their contribution to total assimilation pool of the crop becomes less or often negative. There is therefore an optimum LAI for maximum dry matter poduction which is reached when the lowest leaves receive just sufficient light for photosynthesis to balance respiration e.g., when the lowest leaves are at compensation point and the canopy as a whole has reached maximum net assimilation. Below optimum LAI light energy is not being fully intercepted. Above optimum LA the leaf area is not being utilised at maximum efficiency.

F. Major Source of Water for Development and Management in Dryland Areas

(i) Precipitation in the form of rain can not yet be effectively controlled by man. Water resource and conservation projects must be designed to accommodate the wide range of annual as well as seasonal precipitation.

(ii) Surface waters are the most obvious source of fresh water that can be tapped. Lakes, ponds, rivers, streams, reservoirs and catchments/watersheds are examples of surface water sources.

(iii) Ground water is a major reservoir for fresh water. Ground water supplies contained in aquifers are relatively stable unless influenced by man's activities. This water contained in deep aquifers can be tapped by constructing bored wells and water lifted. When ground water is within 3 metres of the land surface it may move upwards, against gravity, through small soil pores by process known as capillary action. It thus becomes available to shallow rooted plants such as most agricultural crops.

G. Water and Dryland Agriculture

Like any other area water is essential for agricultural production. In drought prone area production depends on soil water as extraneous application of water may not be possible for a variety of reasons. Good crop growth depends upon

the availability of plant nutrients in the soil, sunlight, adequate water for seed germination, growth flowering and maturity. For the most part our rainfall areas have plenty of sunlight. The limiting factor is the soil fertility. The farmer is to control the movement of water so as to minimise land degradation, loss of soil nutrients, preservation of soil structure etc., maximum effort should be to encourage percolation of water. Soil and water conservation measures need be taken to reduce erosion, and conserve water. Water harvesting is one major activity in that regard, unlike domestic water requirments agricultural needs are seasonal, limited to all or parts of a growing season. Normally small scale projects like water harvesting structure need not necessarily provide water for year-round irrigation. Crops can be selected to take full advantage of a wet season and supplemental source may be needed only for short periods at the beginning or end of growing season

Water resource for agriculture can be intermittent. Unlike human or industrial requirements most crop plants do not require a constant flow or constant volume of water. Plant requirements vary with time in the life cycle (i.e germination, growth, flowering and maturation) and during some stages plants are capable of surviving with little or no rainfall. Using the soil as a water reservoir, plants can endure long periods between available or irrigation.

Because of these differences between agricultural and other uses, the planner has a wider range of sources to tap for development. For instance a surface source unacceptable for human consumption because of algal bloom or faecal contamination can still be used for irrigation. On the other hand water may contain salts which affect taste but are not necessarily harmful to humans, yet may accumulate in soil and are harmful to plants. So while issues of water-supply and quality are less demanding for agriculture there are still important limitations.

Since rainfall can not be increased except by unreliable and expensive technology, ways must be found to increase agricultural utility of the amount that falls as precipitation. There are several possibilities that may produce excellent result. Some of those are—

(i) maintaining a good vegetative cover. Surface runoff is greatest when the land surface is bare. No tillage agriculture is now-a-days advocated. Orchards and plamations utilise off season rainfall and reduce runoff..

(ii) contour ploughing and contour tillage may be adopted

(iii) strip crops, i.e. alternate strips of erosion resisting crops in erosion permitting crops may be raised

(iv) include a legume in the crop rotation.

(v) Sloping Land Agricultural Technology may be adopted This includes terracing of land.

(vi) increase the organic content of soils

(vii) mulching of bare surfaces may be made to reduce evaporation

(viii) raise low duty crops

(ix) raise short duration crops and adjust sowing of crop to the onset of rains.

(x) In saline or alkaline soils raise saline or alkaline resistant plants

(xi) construct small water harvesting structures dispersed over the areas.

(xii) resort to water spreading in the field.

H. **Water and Dryland Horticulture:**

Our arable farming has dominated dryland agriculture. It is only recently that alternate land-use systems viz. agroforestry, agri-horticulture and dryland horticulture are receiving attention in dryland agriculture. This is because with whatever rainfall we receive particularly in D. P. A. P areas these systems give stability to resource poor, small and marginal farmers. Of the various alternate landuse systems, the systems which have fruit components viz, agri-horticulture and dryland horticulture are readily accepted by farmers

Dryland fruit trees are deep rooted and hardy and thus can tolerate aberration in mon soon like delayed onset, intermittent dry spell, early withdrawal, etc. These trees yield at least something in drought years when the arable crops are likely to fail completely. Thus it results in stability of income in drought prone areas.

Most of the arable crops are grown during the monsoon season which accounts for 80 per cent of the total precipitation. The remaining

20 % off season precipitation goes waste either as evaporation, run-off or percolation (to be evaporated later) But if trees are present which is a permanent vegetation, the off season precipitation is gainfully utilised and at the sametime soil is protected Some fruit trees like ber also produce fodder The leaves of ber is a nutritive fodder for cattle Ber leaves contain about 10% crude protein Fruit trees also produce fuel and timber

To direct moisture to root zones of plants contour furrow/trench planting system may be adopted

I. Water and Agro-Forestry

It is defined as a sustainable land management system which increases the overall yield from the land, combines the production of crops (including tree crops) and forest plants and/or animal simultaneously or sequentially on the same unit of land In brief it is the practice of raising trees in agricultural landscape

J. Aquaculture in Dry Farming Area

In D. P. A. P. Project large number of farm ponds are being constructed These can be utilised for aquaculture particularly pisciculture. This will supply important supplements to the nutrition or economy of drought prone areas. Culture of fast growing fish species have often been highly successful and have great potential for protein deficient areas. Annual fish harvests exceeding 2,000 Kg per hectare have been achieved.

In preparing fish culture projects several environmental factors must be considered, first being the amount of water available for the ponds. Water supplies must be adequate to fill the ponds and replenish water lost by evaporation and seepage Water must be free of toxic chemicals. If unlined ponds are planned, the soil must be relatively impermeable to water

K. Efficient use of stored water

Under dryland agriculture schemes large number of small water recycling projects popularly known as water harvesting structures are being executed. Water harvesting structures include farm ponds, diversion weirs, cross bunds etc It is of immense importance to utilise judiciously very costly stored water, after cutting down seepage and evaporation losses to get the maximum benefit out of it. The question to be answered are how to convey the water from ponds to the fields, when to irrigate, how to irrigate, what should be the crops and cropping system that respond best to limited water supply Here we indicate about conveyance of water Other points have been considered earlier

Water collection in small ponds or other type of water harvesting structures is limited. As losses are high and efficiency of utilisation is low, flooding is precluded. The principle of application, therefore, is to cut down conveyance losses and evaporation losses and to force water deep into the profile where roots are extensive and can better utilise the moisture It is estimated that 20—50 % of irrigation water is lost during conveyance from the source to the field in different soils due to seepage and percolation losses, if the channels are unlined or in the absence of proper lining in dry farming area high evaporation losses may be reduced by providing closed conduits (pipes) for checking all losses Lining of channels will minimize seepage loss, prevent erosion in the channel, provide control against damage by rodents and convey larger amounts of water in the channel of given size Lining materials may be natural clay, bentonite (Sodium bentonite a fine texture colloidal clay), bituminous materials (asphalt etc.) soil cement lining, stone or brick lining, cement concrete lining, polythylene, rubber plastics etc.

All the lining materials listed above, have their own advantages and disadvantages and non of these can be considered as the best under all circumstances

L. Conclusion

By rational use of limited water available and adopting dry farming techniques as enumerated in this paper food production will increase labour will be generated to combat unemployment, environmental conditions will be more harmonious and congenial. Above all drought flood hazard will be reduced Considerably, thus eliminating demand for test relief grants and subsidy and assistance from State exchequer

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Shifting Cultivation to Horticulture :

"A Case study of the Dongria Kondh Development Agency (Kurli), Chatikona"

Dr A. C Sahoo

The paper highlights how a primitive sub-tribe accepted horticulture as the suitable alternative against the pernicious practice of shifting cultivation It illustrates that success of development programmes depends on perfect understanding of the development practitioners about life style, cultural values, traditions technology and resources available in a particular community. An attempt has been made to discuss the linkage between eco-cultural nitch and socio-economic development of a simple society. It elucidates the diversified role of societal sub-system, social structure, ecology, economic growth, development planning in the developmental process. It has also sought to explore the nature and limits of future growth

It is a case study of the Dongria Kondh Development Agency (Kurli), Chatikona in the Rayegada district of Orissa. Among the 62 tribal communities of Orissa the Kondhs numerically top the list. On the basis of socio-economic characteristic features Kondhs can broadly be divided into several sections such as Desia Kondhs, Kutia Kondhs, Dongria Kondhs, Malua Kondhs, Buhar Kondhs, Pengo Kondhs, Nangulli Kondhs, Sitz Kondhs and some others. The Dongria Kondhs are a major section of the Kondh tribe mostly inhabit a contiguous area of the Niyamgiri hill ranges It covers some portion of the Bissam-Cuttack and Muniguda blocks of Gunupur Subdivision, Kalyansingpur block of Rayegada Subdivision in Rayegada district and Biswanathpur area of Lanjigarh block in Kalahandi district They are altogether about 10,000 in number out of which 6,493 only are found in Rayagada district The areas inhabited by the Dongria Kondhs are mountainous rising steeply from 1,200 ft to 4,900 ft above the sea level. At present two Micro-projects one is for the Dongria Kondhs of Bissam-Cuttack and Muniguda blocks with its Headquarters at Chatikona and the other one is looking after the same sub-tribe of the Kalyansingpur block with its Headquarters at Parsali. Yet, especial attention is to be given for development of the Dongria Kondhs of the Biswanathpur area The discussion here would be confined to the Dongria Kondh Development Agency (Kurli) Chatikona in connection with the horticultural development programme among the Dongria Kondhs. In accordance with the decision of the Government of India, Ministry of Home Affairs certain tribal communities of the country were identified as primitive tribes on the basis of the guidelines issued. Major considerations for inclusion in the primitive tribe list was (i) low growth rate or stagnant population, (ii) pre-agricultural level of technology and (iii) low level of literacy Along with some other tribes, communities the Dongria Kondhs were also identified as one of the primitive tribal groups and a Micro-project was established in the year 1978 under Societies Registration Act. The agency covers a tribal area of 115 sq. Kms. and 67 villages distributed in 7 Grama Panchayats under the jurisdiction of Bissam-Cuttack and Muniguda Blocks As per

the study conducted the year in 1986., the target Dongria Khondh beneficiary households were 1,233 comprising a total population of 4,975 A Governing body was set up under the Chairmanship of the District Collector and some officers and non-officials as the members. The Governing Body was set up to suggest the suitable schemes and review the progress of work of the agency. A Sub-Committee was set up under the Chairmanship of the Project Administrator ITDA. Gunupur who happens to be the Vice Chairman of the Governing Body to review the activities and progress of the agency as per the annual action plan approved by the Governing Body

For execution of various development programmes a group of staff comprising a Specie Officer an Agriculture Extension Officer a Welfare Extension Officer, two Amins, one Chainman and one Head Clerk were deputed to the Agency from their respective parent departments. Apart from these the Agency had appointed 33 multi purpose workers, one L. D. C. one Driver, two field Assistant, one Pump Driver two Class IV Employees and one Watchman In due course some Nursery Watchers and Field Attendants were appointed on daily wage basis. With the help of the above staff the Agency, tried to bring around development of the Dongria Kondhs. The following stages of activities were followed to achieve the best in course of implementation of various sch mes

The Special Officer along with his staff visited seventy Dongria Kondh villages to gather sufficient knowledge about their culture. environment natural and human resources. technology and skill, heart and mind of the people. Each village area and household were touched to assess the possibility and feasibility of development schemes. All the people were contacted to ascertain their feelings and sentiments. The village traditions secular magico religious and influential people were invited for discussion Selection of core programme and briefing the same to the higher authorities adoption of selective Centre and receptive villages to begin with were followed in due course. Keeping in view the budget, manpower and workload annual programmes were finalised. Organisation of village meetings, coverage of all the beneficiaries of the selected village. listing out requirements, selection of site preparation of land, arrangement of planting materials, formation of working zones, training to the staff, training to the beneficiaries, allotment of works among the staff, mode of collection and distribution of planting materials, assistance to different categories of beneficiaries, type of planting materials and technology to be induced etc were arranged systematically to avoid inconvenience and bottlenecks. Due emphasis was given on watch and ward, application of fertilizer, pesticide and hormones, weeding and maintenance even sentiments of the people and their socio-cultural values Arrangements of suitable market, funds and involvement of people in every aspect of operation were some of the major considerations Due advantage of different fruits of their culture and social practices were taken to enhance the development progress.

The Dongria Kondh Development Agency (Kurli) Chatikana area is predominantly inhabited by Dongria Kondhs as the original settlers. Now a days a group of Scheduled Caste people locally known as Dombs are also living with them The area can broadly be divided into several 'Muthas' the territorial divisions which are the clan territories Among the clan groups mention may be made of Jakasika, Wadaka Nisika, Kadraka Pusika Sikaka, Kutruka, Praska Wangasika, Kerska, etc They follow clan exogamy One can witness clan feuds because of transgression of territorial rights, abduction, non-payment of bride price capture of women, suspicion of witch craft and many others. Among the Dongria Kondhs clan exercise control several socio religious and economic activities, is of special mention The Dongria Kondhs depend on forest in one form or the other for their survival Even today they depend on forest collection for their survival in the lean period. Ragi gruel and rice of small millets are their main food items They like non-vegetarian food items, specially buffalo flesh and dry fish very much. 'Salap' sago-palm sap and liquor prepared out of mahua flower, different fruits, molasses, rice and small millets are relished all over the year Both male and female members put on several types of jewellery keep long hairs and use embroidery clothes for socio-cultural significance

The Dongria Kondhs are very beautiful to look at and are having strong and stout body They are out spoken upright straight forward and hospitable The Dongria Kondhs are very proud of their village clan and culture and reveal their cultural heritage through the Niyam Raja They are basically shifting cultivators and skilled in raising orchards and growing fruit bearing

trees. In each village 'Adasheta' girls dormitory, 'Sadar' community centre, 'Jankudi' shrine of the protector deity and 'Dharanipanu' Shrine of mother earth are located. The Domb settlement is situated a little apart. Total number of Dongria Kondh household in a village vary from 5 to 50. The Dombs are subservient to the Dongria Kondhs. They market the surplus and supply their daily material necessities. The Dombs arrange loan, act as mediator in socio-economic and political matters. Works like herding the cattle, cleaning the village street etc.are done by them. An influential Domb is appointed as village messenger and his role is very vital and meaningful in several sphere of socio-economic and cultural activities. The Kutia Kondhs are quite aware of the exploiting habit of the Dombs but rarely they stand against. Rather the Dongria Kondh consider the Dombs as their menials and subordinates. The services of the Dombs are taken into account by the Dongria Kondhs as the special privilege.

It has already been mentioned that the Dongria Kondhs are lover of fruit trees and orchards. The agroclimatic condition and soil favour growth of fruit trees and orchard in their area. The Dongria Kondhs were accustomed to horticultural habits and growing jackfruits, banana, mango, citrus, turmeric since time immemorial. Even pineapple they have been practising since last 5 decades. The people are traditionally trained and their culture has accepted this practice without any inhibition. In course of discussion in several village meetings the people showed their interest towards fruit trees. Plantation of fruit trees was also an immediate answer to check shifting cultivation and soil erosion. Hence it was adopted as the core programme and in due course tied up with other programmes of the agency for the sustainable economic upliftment of the target people.

To start with the Special Officer with some of the extension workers of the agency visited villages, contacted people, observed ongoing actions of the people, acquainted with the land and conditions. All the villages situated in remote areas were covered by crossing hills and mountains. After listening the people in the community centre, at their respective houses and near hearths, effective and potential beneficiaries were selected irrespective of sex, age and status. These explorative tours made the development practitioner clear about the feelings and wants of the people and their sentiments and values of life. To motivate the people, to support them for their all-round development and to make them aware of their problems and its solution as well as to bridge up the gap between the beneficiaries and the development practitioner some multi-purpose workers were recruited. These workers were knowing or learnt 'Kui' the Dongria Kondh dialect and imparted training in agriculture, horticulture, animal husbandry, soil conservation, education, co-operation, health and nutrition, industry and others that are required for bringing success in the development schemes. According to their capability and intelligence the multi-purpose workers were entrusted with the responsibilities of a village or villages. The staff of the agency were given their job chart in the line they have got training and expertise.

For effective implementation and close and timely supervision of various developmental programmes the agency was divided into three zones. Villages under each zone were regrouped into sub-zones. For different types of function the zonal or sub-zonal people were called for meeting together. Mostly these centres were functional centres for distribution of benefits or collection of surplus as well as for demonstration, training and extension work purposes.

The multi-purpose workers were teaching the children in the morning and adults as well as children in the evening in their respective villages. From each village five community leaders both male and female were selected to lead the village for all development purposes. One male and female known as Gram Panchalek and Gramma respectively were selected in a village meeting who worked among their own people and carried the developmental messages from the agency to the people. And also they conveyed the messages of the people to the agency authority. In collaboration with the village elites and leaders mentioned above a detailed survey was conducted to gather all possible information about the village and household to use as baseline data and chalk out area location and beneficiarywise plan for the agency. Apart from all these detail data on land, forest, crops grown, horticulture, irrigation, inter-personal relation, inter-village relation, 'Muthe' organisation, important events like, birth, marriage, death, feuds, quarrel, conflict and tension etc. were enlisted for future action. Different fairs, festivals, important occasions, and community level functions were also recorded. Information related to Sch. Caste and Dongria Kondh relationship, past history of development

in the area and all the festival, agricultural and seasonal calendars, etc. were recorded for planned action. Through the village visits, many facts about various customs, habits, and living condition were collected which served as guide in evolving strategies for development and taking correct decision in execution of programmes. After determining the nature of problems and felt-need beneficiary identification and quantum of assistance were finalised. According to the necessity orientation training connected to various developmental programmes with special reference to horticulture were given to the people.

Keeping in view the availability of natural resources socio-cultural significance of the village and degree of acceptance and rejection of the people towards new horticultural programme demonstration of plantation and establishment of nursery for raising various types of seedlings central and significant villages were selected and involving the people required seedlings were raised. In the entire process of operation people of different sex and age were engaged who were properly trained in the technology and scientific methods.

Monitoring of the programme was arranged in such a manner that there was no chance in delaying the course of action. By the time the seedlings are made ready, the people were motivated to take up pre-plantation programmes like cleaning the area, diggingpits, arranging stones for fence and water channel from stream for irrigating the plants. Different assignments were distributed among the staff in such a manner that the people developed interest for plantation of fruit trees. Supervisory functions were distributed at different leve to cross-check different course of activities. Steps were taken to record the plantations and orchards in favour of respective beneficiaries or to give the usufruct right. Planting materials available with the well-to-do people, raised in the nursery, purchased from the outside were supplied to the people according to their need and pre-plantation performances. Since details of the felt-needs of the people were finalised sufficient before, the planting materials and other requirements were supplied to the people in their respective sub-zone or zonal centre. Before supply of planting materials the beneficiaries were given all possible training in connection with the planting materials, plantation maintenance, follow up care and harvesting of the crop.

According to the situation and condition of the beneficiary the people were given assistance in two different ways, one under the infrastructural development scheme and the other on individual benefit programme. In case of the former one the beneficiary was provided with all the benefit from the agency. In the latter case he received some inputs technical and economic assistance according to the necessity and within the assistance norms. By nature the Dongria Kondhs are very competitive both at the individual level and at the village level. These personality traits and cultural characteristics which were cause of inter-group feuds were diverted from destructive goals and harnessed in the developmental programmes for constructive purposes. The dormitory and village community labour force was utilised for extension of plantations. The youths who were engaged in dormitory affairs were diverted for profitable plantation purposes by arranging bride price and solemnising their marriages. The youths got married checked clan feuds and in due course as per the tradition of the Dongria Kondh the couple should raise their own orchards, as permanent economic asset for their future. For gainful production water sources available were utilised to provide irrigation facilities through contour irrigation channels. Different new species grafts of high yielding varieties and new technology were introduced for better efforts in horticultural development. Mixed orchards, inslu plantations and revival of their traditional plantations were encouraged among the Dongria Kondhs which gave very good result. The magico-religious practices and beliefs associated with plantations were brought into action in the process of operation to win over the heart and mind of the people. Co-operation of the village council and support of the women yielded very good result for extension of plantation programmes. Organisation of village meetings, Inter Dongria Kondh Council meetings and award of prizes to the successful workers encouraged the ego-centric and prestige conscious Dongria Kondhs to surpass their competitors and opponents either at village or personal level. A system of assistance and packages of programme were arranged in such a manner that people adopted improved horticultural practices and covered large areas under plantation programmes. In the agency area pineapple plantation was taken in extensive scale. Plantation was preferred where jackfruit and mango trees are present so that these plants were provided with required shade which is favourable to the growth of the pineapple plants. The Dongria Kondhs prefer

close spacing during plantation which in long run decreased the production but helped in protecting soil from erosion. Pineapple were grown without irrigation. Thick deposition of leaves get decomposed and provide humus to the soil. As such the soil type, drainage system, cool climate, lighter shade, milder sunshine, medium altitude etc. all in combination are congenial to the good growth of the pineapple plants. The Dongria Kondhs, after plantation of suckers only going for weeding then suctioning for which they receive cash from the local Scheduled Caste Dombs much before the harvest. In some cases the orchards were sold forth years together. The Dongria Kondhs are very much proud of their culture and people. They usually do not pluck fruits for sale which they consider as lower people's job. Therefore these type of works are entrused to the Dombs live adjacent to them. Because of these Socio-economic factors the Domb traders purchase the orchads for which they finance considerably earlier. The parasitic attitude of the Dombs towards the Dongria Kondh is very often put the latter ones into peril. The services of the Dombs were considered indispensible by the Dongria Kondhs. In purchasing Jackfruits the Dongria Kondh people were also adopting same method. The banana plantations were also not giving substantial return. Mango trees are communally owned on village level hence, the money received are kept in community funds and spent in community level functions. But by and by introduction of better technology, new variety of species and coverage of extensive area under plantation brought an immense change in the project area as an alternative to shifting cultivation and sustainable economic upilft of the people. Previously the people were selling their produces in the nearby weekly markets which the people produced fruits in large scale, steps were taken by the agency to save the Dongria Kondhs from exploitation and ensure fair price. Therefore, people were motivated and they registered a Co-operative Society known as Niyamgiri Fruit Growers Co-operative Society (NFGCS). To start with the Special Officer and the Welfare Extension Officer, played vital role but in minimum possible time the Dongria Kondhs took over the entire charge and managed the Society very nicely. The major function of the Society was to fix price of different products, procurement of agricultural and horticultural products, to provide the people their daily consumer goods and interest free loan at the time of their need. It also provided the people all that they need for development of plantation in the Niyamgiri hill ranges. Organising meetings the people were made conscious about the actual price of their harvest. The mode of fixing the price was tought by means of demonstration. As per their tradition once price determined for a particular orchard or tree never comes below the fixed level in the subsequent years. Although at the outset of implementation this method of pricing was very difficult because of the strong resentment of the exploiters but hearty co-operation of the Dongria Kondhs helped in bringing success and solved a major agreed problem for all the time to come. Fruits like pineapple, jackfruits, orange and banana were sent to Madras, Visakhapatnam, Kakinada, Srikakulam, Nagpur, Raipur and many other places. So also the pineapple suckers were purchased by different development agencies inside and outside the State.

Since inception of the project till the year 1987-88 out of 28461.51 acres of the area the coverage under horticulture was 9091.51 acres. The details of varieties and quantitative achievements is as follows

		Acres
1	Orange, Lemon and other citrus varieties	3545.38
2	Banana of different varieties	1547.51
3	Mango (both inarlu and grafts)	1247.07
4.	Pine apple (Spanish and other varieties)	1127.80
5.	Cashewnut	610.14
6.	Mixed plantation (Banana and pineapple, citrus and pine-apple, mango and pineapple, jackfruits and pineapple, banana with mango grafts, banana with citrus plants and some other types.)	428.36
7	Turmeric and ginger	329.00
8	Papaya	140.90
9	Sapota	116.85
10	Lemon	..
11	Jackfruit	61.85
12.	Lichu, Guava, Ilachi	34.75

Due to these extensive areas covered under plantation the shifting cultivation area was reduces to a greater extent and the economic condition of the people also developed. The plantation programme as the core scheme in the agency which was tied up with other development sectors such as education, soil conservation, irigation, co-operation, industry, health and sanitation and many other welfare activities of the Agency. In practice it was found that horticulture is the best answer to control shifting cultivation in the area and for bringing sustainable economic uplift of the people. Along with economic development the socio-cultural transformation in positive line established yes, health and happiness among the Dongria kondhs.

From the discussions made in the preceding pages it may be analysed that development is embodied with serveral socio-economic and human factor which should be accompanied by imaginative planning and human engineering. The cultura carriers and barriers in the development process specially in the field of economic pursuits, social organisation, political system religious beliefs, traditional practices and customs are to be conceived by the development practitioners prior to launching any development programme. Quick and unimaginative actions invite danger hence one should earn from the people and apply for their benefit. There might be individual opinions but there is a core of common purpose in allsimple societies which the development practitioner should explore and discover. It helps in evolving appropriate strategies for the development of the people of tribal or simple societies interact in three broad zones. The people in the first zone of interaction are their lineage, clan, village and tribes men. The second group of persons who come in the next zone of interaction are the people with whom they maintain some distance but in many ways there is symbiotic relationship. The third group of people are absolutely outsiders and strangers who have no contact with them. Even if the third group of people go and approach for all good intentions they may not be accepted because of several socio-cultural constraints. Hence before embarking upon any innovative programme one has to establish adequate rapport with the people and gain people's confidence.

Any type of economic development among the tribal people involves socio-cultural aspects hence persuance of development strategy considering cultural factors, would achieve the best. Pragmatic approach and right type of development practitioner could sort out major problems tactfully. However confidence in the people for whom one works, confidence in oneself and confidence in the programme to be brought into action are very significant as basic needs of success in development of people of a tribal community.

TRIBAL AND HARIJAN RESEARCH-*CUM*-TRAINING INSTITUTE
BHUBANESWAR

TRAINING COURSE ON TRIBAL ECONOMY ECOLOGY AND DEVELOPMENT

Sponsored by DEPARTMENT OF ENVIRONMENT FOREST AND WILD LIFE, GOVERNMENT OF INDIA, NEW DELHI.
(DECEMBER 16—20, 1991)

SEMINAR SESSION

The 19th December 1991 (Friday)

Session: — 10-00 a. m. to 2-00 p. m.

Chairman — SHRI R. K. MISHRA, I.A.S
Deputy Chairman, Orissa State Planning Board Bhubaneswar

Course Director — Prof. K. K. MOHANTI
Director Tribal & Harijan Research-*cum*-Training Institute

Theme: — "Forest Resources, Forest Projects and Development of Tribal Economy"

Papers Contributed

1. "Tribes and the Forests—An overview"
   Prof. N. K. BEHURA.
   Professor and Head, Department of Anthropology Utkal University, Vani Vihar Bhubaneswar
2. "Rainfed Farming in Tribal Areas for Environmental and Food Security"
   SHRI DIBAKAR SAHU
   Joint Director (Retd.) Soil Conservation Directorate Bhubaneswar
3. "Podu—An Ecological Hazard
   Dr. C. R. MOHAPATRA, I.F.S.,
   Director Nandankanan Biological Park, Bhubaneswar
4. "From Shifting Cultivation to Horticulture—A case study of the Dongria Kondh Development Agency"
   Dr. A. C SAHOO
   Officer on Special Duty, Tribal & Harijan Research-*cum*-Training Institute, Bhubaneswar

Guest Participants

1 MRS CHANDRAMANI NARAYAN SWAMI, I.A.S.,
Commissioner, Agriculture & Rural Development Orissa, Bhubaneswar

2 SHRI R. N. SENAPATI, I.A.S.,
Director, Census Operation, Orissa

3 Professor K. MAHAPATRA,
Director Academy of Tribal Dialects and Culture, Adibasi Exhibition Ground, Bhubaneswar

4 SHRI TARA DUTTA, I.A.S.,
Director (T W) & Joint Secretary to Government, H & T W Department Bhubaneswar

5 SHRI A. PRADHAN, I.F.S.,
Addl Chief Conservator of Forests, Office of the Principal C. C. F., Bhubaneswar

Trainee & other Participants — Annexure I & II

Chief Rapporteur .. Shri J. K. PANDA,
Research Officer, Tribal & Harijan Research-*cum*-Training Institute, Bhubaneswar

Associate Rapporteurs

1 SHRI BALARAM DASH,
Research Assistant, Tribal & Harijan Research-*cum*-Training Institute, Bhubaneswar

2 SMT SUREKHA RAY,
Research Assistant, Tribal & Harijan Research-*cum*-Training Institute, Bhubaneswar

MINUTES OF DISCUSSION

(1) The seminar commenced at 10-00 A. M. on 19th December 1991 in the class room of the Institute. After welcoming the participants Prof K. K Mohanti, Director THRTI emphasised that the seminar would give an opportunity for exchanging ideas, thoughts and experience among the trainees as well as the officers of the different Departments present here

In course of his welcome speech, he pointed out that the tribal people have symbiotic relationship with the forest. Besides providing food and shelter forest plays an important role in the tribal economy Minor forest produce like ac resin, honey timber and firewood which the tribal people collect from the forest fetch them a substantial income The forest also supplies medicinal herbs which give relief from pain and cure illness of various types. In nutshell, he pointed out that the forest occupies a pivotal position in the economic, cultural and sociological life of the tribal people. Prof Mohanti requested the Chair to invite the contributors to present their papers.

(2) Prof. N. K. Behura in his paper highlighted the necessity of forest for the tribal people. The forest and the tribes are inseparable. From time immemorial tribes were in the forest without outside interference As time passed newdevelopment took place and the tribes were pushed down from their natural abode and infiltrators became the owner of the soil. A self dependent life when disturbed became a life of wants and miseries. The socio-cultural milieu came under the terrible blow and the whole eco-system got disturbed. Nineteenth century saw a growth of capitalistic enterprises, such as, railway shipping and communications and rampant destruction of forests forgetting to give compensation or other alternative to the original tribal settlers of the soil. The forest dwellers lost their hopes as a result of which economic depression and poverty made their life miserable

Though different forest policies enforced from time to time the idea of conserving the forest have forgotten the tribes dependence on forests for their minimum economic subsistence.

Keeping this in view, the National Commission on Agriculture in its report early in 1970 suggested various factors for management of forest resources in consonance with providing maximum goods and services for the well-being of the tribal people. Besides, the Commission also suggests various measures for conservation of the existing forest growths and creation of the new forests. All these objectives of policies undoubtedly restored and conserved the forest growth to some extent but nevertheless touched the question of the traditional rights of the tribal communities in respect of forest.

Dr Behura suggested that communal ownership of forest should prevail in order to provide adequate facilities to harness the forest growth for economic support of the tribal communities living there. The socio-religious life of the tribes are intimately connected with the forest. It is, therefore necessary to protect the interest of the tribal people by allowing them their community right over specific territory of forest land.

(3) Shri D. Sahu in his paper stressed that dry-land farming is very important for the tribal areas. He defined dry-land farming as rainfed farming which is undertaken and dependent entirely on rainfall. Dry-land farming is that farming which is practised in the rainfed areas and the hill areas where low rainfall occurs. In rainfed farming conservation of moisture is not an important aspect. The important aspect is the water conservation and management system.

Shri Sahu gave ample stress on water harvesting structures for proper water and land management. In describing the difference between irrigation and water harvesting, he has stated that irrigation is done in fields with standing crops while water harvesting is the process of storing water in the fields where crops may or may not be there. The moisture keeps the soil wet and provides ample water resources for the crops.

Coming to the water management in the World Shri Sahu pointed out that 96·55 per cent of water comes from ground water strata. The other sources are lakes, rivers, atmospheric vapour and biological factor which come to only 1·65 per cent. Hence, water management through ground water strata is of basic importance.

Particularly in India proper water management practices have to be followed so that massive loss of water resources can be avoided. To organise proper water management system in India, dams in suitable places in big and small rivers are necessary, so that effective flood control as well as water management can be made.

By introducing new methods for dry land farming proper ecological balance can be maintained. It will enhance the socio-cultural life of men as well as keep the environment balanced.

Describing the major source of water for development and management in dry-land areas Shri Sahoo further stated three points of conservation and management of water resources, namely (*i*) precipitation of rain water, (*ii*) management of surface water and (*iii*) harvesting of ground water resources. The major factors to create a successful dry land agriculture with soil fertility and to limit the land degradation conservation of water is essentially necessary.

(4) Dr C. R. Mohapatra, while presenting the abstract of his paper highlighted ecologically hazardous effects of the "Podu" cultivation by the tribal people. Focussing particularly the experience of Orissa he put forth a picture about the demographic distribution of tribes in the State and their occupational pattern *e.* about 61 per cent are agriculturists/21 per cent agricultural labourers/and the rest 18 per cent are engaged in forestry, mining, fishing etc.

He indicated that the entire tribal population can be divided into 3 categories namely Nomadic, Hill tribes/ and Settled tribe cultivators.

Coming to the problem of shifting cultivation the author divided the practice of shifting cultivation into 3 groups namely (a) active (b) (b) dormant and (c) extinct. He viewed that shifting cultivation is harmful and detrimental to the maintenance of the environmental balance and leads to deep soil erosion. This goes on in a cyclic manner with a time gap. Community ownership and authorised legal occupation are the criteria for gradually doing away with the shifting cultivation.

In order to wean away the tribal people from shifting cultivation all agencies and organizations working in the tribal areas have got their positive role for providing alternative economic pursuits and convincing them about the disadvantage of shifting cultivation. Alternative economic measures can be suggested only after earning fully well the socio-economic conditions of the

tribes. Proper training for extension personnel is an essential part which may be organized by the Forest and Tribal Departments in collaboration with the Agricultural University. Motivation and guidance is also necessary to convince the shifting cultivators. Afforestation is an important aspect for giving an alternative profession to the shifting cultivators.

(5) Dr. A. C. Sahoo in his paper "From shifting cultivation to horticulture" (a case study of the Dongria Kondh Development Agency) emphasized the developmental process for the most primitive tribes, like the Dongria Kondhs through formation of a Micro-project.

The paper in nutshell has depicted the various aspects relating to the formation of micro-project and execution of the various developmental schemes in order to divert the attention of the Dongria Kondhs from shifting cultivation to horticulture.

The Dongria Kondhs of Bissam-Cuttack area of Muniguda Block of Gunupur subdivision in Koraput District are one of the primitive tribal communities. They have low growth rate, pre-agricultural technology and low level of literacy. The total villages covered under this project is 67, distributed in 7 Gramapanchayats. The project is an autonomous body under the Chairmanship of the Collector, Rayagada. With a body of nucleus staff the project undertakes various developmental programmes. Horticulture being the main source of livelihood of the Dongria Kondhs, the Agency took-over responsibility of marketing the horticultural produces through a Co-operative Society.

The Dongria Kondhs were mercilessly exploited by the Doms. Now they can handle their own horticultural produces and earn a good income. This created a sense of self-confidence and self-reliance in them. The project is to undertake further plantation of new varieties of fruit-bearing trees.

The Project also invested a good proportion of allocations for the spread of education through adult-education centres and night schools. Various infrastructural development programmes were also undertaken as a result of which the whole area turned to be very lively. Dongrias who once upon a time were shifting cultivators have largely changed their occupation to settled agriculture particularly to horticulture.

(6) Smt. Chandramani Narayan Swami, I.A.S. Commissioner, Agriculture and Rural Development, Government of Orissa in her talk on tribal development and forest highlighted the utility of trees which is otherwise termed as "Kalpataru". The life of the tribal people is deeply connected with the forest and they are inseparable. The major economic pursuit of the tribes is derived from the forest and their economy substantially depends on the forest growth.

While implementing the different schemes for conservation of forests she suggested that proper attention needs to be given for the welfare of the tribal people who are the original settlers of the soil. During the implementation of these schemes, the interests of the tribal communities must not be neglected worsening the position of the already poverty striken tribal economy.

The Agencies, like the I. T. D. A., T. D. C. C. and the Forest Development Corporation should take adequate steps and safeguard the interest of the tribal people while implementing their different programmes.

She also emphasised on the plantation of medicinal herbs and herbal gardens in the tribal areas.

(7) Shri R. N. Senapati, I.A.S. Director Census Operation, Orissa in his talk gave a very clear picture of the tribal demography of Orissa. Side by side he also highlighted the economic pursuits and the living pattern of the tribes inhabiting in the remote tribal areas.

As per the Census 1981 as many as 7 districts of the State constitute major tribal population of which 3 districts have more than 50 per cent tribal population and such districts are Koraput, Mayurbhanj and Sundergarh.

In course of his discussion he pointed out that more research work should be done on ecology and economy in the tribal areas.

He also suggested that no restriction should be imposed on the tribes for the collection of minor forest produce.

He further pointed out that the tribal people should be given a portion of adjoining forest area for protection, conservation and for their genuine use.

(8) Prof Khageswar Mahapatra Director, Academy of Tribal Dialects and Culture pointed out that the tribal life and culture centre round the forest They have their own forest Gods and Goddesses

He emphasised that tribes are not destroying the forest growth because they know they live due to the forests Rather other agencies are responsible for it

The tribal people are practising shifting cultivation from time immemorial There should not be any drastic restriction on the practice of shifting cultivation without giving any viable economic alternative for their living

9) Shri Tripathi, A.S., Director Tribal Welfare and Joint Secretary to Government, H D T W Department Government of Orissa emphasised that we should not consider development in isolation but in integration with the ecology and environment. Planning from the top and execution at the bottom is a contradiction with each other. Developmental concept is new to the tribal people Hence, their involvement in the developmental process would help them for their upliftment

He pointed out that while the percentage of literacy in Nagaland is nearly 80.7% it is only 3% in the Bondo Hills. Improvement in education and literacy had been possible due to the dedicated work of the foreign Christian Missionaries, which made the tribals self-consciousness for their development. Agencies working in the tribal areas must not lack dedication and devotion if the desired result is to be achieved in the field of tribal development

(10) Participating in the discussion, Mr. B N. Dwivedi, D. I. G., Forest, New Delhi, pointed out that it is the role of the researchers and the research institutes to find out the exact number of tribal families depending on forest for their economic pursuits and to develop packages for their development

(11) Mr Khajan Singh, A. G., Forest, New Delhi, pointed out that tribal people have intimate relationship with the forests. Therefore, in the larger interests of the tribals, the policy should be to protect the forests and to fulfill the needs of the tribes

He suggested that shifting cultivation may be replaced by horticulture.

He suggested that a multi-disciplinary group of officers from Forest, Agriculture and Tribal Departments may be given responsibility for proper implementation of the programmes in the tribal areas

(12) Shri V Parthasarathy, Conservator of Forests, Andhra Pradesh, opined that the degraded forest land should be distributed among the tribal people in order to create more forest and to preserve it

He also pointed out that senior personnels of the Forest Department should be involved for better implementation of the Tribes and Forest Development Programmes

(13) Mr T. K. Raghavan Nair, C. C. F., Kerala pointed out that there should not be a special nomenclature as "Tribes" This creates separation and it may perhaps be avoided

Further he said that a lot of confusion is arising out of the concept of tribal development and forest development For proper implementation of the various programmes confusion has to be avoided and specific areawise planning may be necessary The concept should be simplified

(14) Mrs. Ranjana Kale D. F. O., Uttar Pradesh has pointed out that the tribal people should not be exploited and they should be given exclusive rights to collect the minor forest produce from the forests which is their prime source of live hood

(15) Mr S. P. Singh, Deputy Director, F. R Madhya Pradesh pointed out that we should make proper planning according to the needs of the tribals

(16) Mr S. D. Sharma, Deputy Conservator of Forests, Himachal Pradesh, pointed out that a overnight change of tribal people is not possible and it would take some time. The destruction of forest is not done by the tribal people but by the so-called civilized people

(17) Mr S Talukdar, Lecturer State Forest Services College, Assam, opined that we should study the main problems of the tribes and adopt proper schemes for their upliftment He gave an example of Tripura saying that developmental activities on raising plantation and animal husbandry fishing, etc. have not progressed much

(18) Mr. M. G. Kutty, Chief Conservator of Forest, Kerala suggested that the tribal people should be involved in the developmental process meant for them from planning to implementation for better result.

(19) Shri R. K. Mishra, I.A.S., Deputy Chairman, Orissa State Planning Board in his concluding address pointed out that time is changing very fast and a new outlook should be evolved. The country is now moving away from "protectionism" to "competition". The economy is being opened up and policies of "liberalisation" and "globalisation" are in the air. The Governmental agencies and the Public Sector Undertakings have come in for heavy criticism for the financial weakness of the State and the national treasury. "Subsidies are likely to go or get drastically reduced. Inefficient and loosmaking Units and agencies are either likely to be "Privatised" or may be altogether abolished. In the changing new World order an atmosphere of competition, self-confidence and self-reliance has to be developed.

When anything goes seriously wrong, it is usual for the politicians to blame the bureaucrats and *vice versa*. It is no use blaming one another for failure to generate sufficient resources or for failure of certain developmental processes.

In any case the national economy can no longer bear the wasteful utilisation of resources by any concerned. The look of the tribal economy had the forest-based economy cannot be very much different from the fast changing scenario and the national economy.

He cautioned that if we continue to mismanage our forests and the tribal development programmes and do not become resource-conscious and cost-conscious, a time may come when all these programmes, including the management of the forests, may have to go in for "Privatisation." It is no longer possible for the country to bear the burden of inefficiency.

He suggested that the national and the State Laws on management of forests and for protection of the tribals should be given a joint look by the forest and the tribal development experts for bringing about reconciliation wherever needed.

The operation of the Forest Conservation Act is creating certain problems in execution of small development works in the field in the tribal and the hill areas. These should be looked into and proper provisions and delegation may be made to obviate the field level difficulties, particularly for the small development works.

He pleaded that for small development works, power should be vested on the District Collector under the Forest Conservation Act to give clearance up to 2 hectares of forest land in individual cases. Proper safeguards can be built in upon this delegation.

Regarding having one-third green cover as the desirable goal, he pleaded that the most practical unit of territory should be fixed for the purpose for computing this one-third area. In the alternative, this one-third area (whatever may be the total extent) may be equitably distributed among the different States, and the Districts.

Development of horticulture and the minor forest produce are very important for the tribal economy. The M.F.P. give the tribals sustenance for about 4 months or more during a year. Similarly, control of the "Podu" cultivation is very important for forest preservation. All these competing needs must be reconciled through location specific multi-dimensional programmes, which should be well-balanced both in conception and in implementation.

Referring to the recommendations of the N.C.A. and the N.C.D.S.A. he suggested that in the tribal areas the top one-third of the hills must be forests, the middle one-third should be for horticultural trees, berry-buses and grass lands and the bottom one-third and "Jhola" lands can be for agriculture.

He emphasised on organisational and institutional arrangements for marketing of tribal produce, products, art goods, handicrafts and the like, and strict vigilance against exploitation of the tribals.

He laid emphasis on revival and encouragement of the "Honey" trade and "Deer farming."

He suggested that the Forest Officers should be given tribal orientation training and the Tribal Welfare Officers should be given forest-orientation training. Winding up, he laid most emphasis on education and training of the tribals, including increasing their ecological and environments' awareness.

(20) Prof. K. K. Mohanty thanked all the participants, speakers and who attended one-day seminar.

ANNEXURE I

List of Trainees

1 SHRI M. KAMAL NAIDU,
General Manager,
O/O Andhra Pradesh Forest Development Corporation,
JNI Building, Hyderabad, Andhra Pradesh

2 SHRI V PARTHASARATHY
Conservator of Forests (Vigilance),
O/O Principal, Chief Conservator of Forests,
Hyderabad, Andhra Pradesh.

3. SHRI D SUDHAKAR,
Divisional Forest Officer
Warangal South, Andhra Pradesh.

4 SHRI B. V PRASAD REDDY
Deputy Conservator of Forests,
Bhadradrajam, Andhra Pradesh

5. SHRI MUN NDRA
Divisional Forest Officer
Kamareddy. Nizambad, Andhra Pradesh.

6. SHRI P ANUR REDDY
Deputy Conservator of Forests (Social Forestry),
Vijaya Nagar Colony, Bellary, Karnataka.

7 SHRI A. D SHEJALA,
Logging Officer,
Joint Director, Forest Operation Division,
Nagpur, Maharashtra.

8. SHRI ANIL MOHAN
Divisional Manager,
Vana Vikas Bhawan, Old Agra Road,
Nasik, Maharashtra

9. SHRI S. D SAMANTA,
Deputy Conservator of Forests,
Bhandra Division, Bhandra, Maharashtra

10. SHRI A. K. MISHRA,
Divisional Manager,
F. D. C. M., Yawatmal, Maharashtra.

11 SHRI MAYI POKYIM,
Deputy Conservator of Forests,
Ghod Project Division, Junnar,
District . Pune, Maharashtra.

12. SHRI B. N. DWIVEDI,
D. I. G. (Forest).
Ministry of Environment & Forests, Paryavaran Bhawan,
C. G. O. Complex, Lodi Road, New Delhi.

13. SHRI RAJ VE KUMAR,
Co-ordinator (Facilities), F. R. I.
Dehradun Uttar Pradesh

14. Dr D N SRIVASTAVA,
Divisional Director Social Forestry,
Raebareli, Uttar Pradesh

15. SMT RANJANA KALA,
Divisional Forest Officer,
North Pilibhit Forest Division,
Pilibhit, Uttar Pradesh

16. SHRI P S MURTY
Divisional Director
Socia Forestry Division,
Azamgarh, Uttar Pradesh

17 SHRI A K GUPTA,
Deputy Director (Wild Life),
Ministry of Environment & Forest Paryavaran Bhawan,
C. G. O. Complex, Lodi Road, New Delhi.

18. SHRI S. TALUKADAR,
Lecturer,
State Forest Service College
Burnihat, Assam.

19. SHRI VIJAYA BAHADUR
Director, Forest School,
Shivapuri, Madhya Pradesh

[redacted]. SHRI S P SINGH
State Director
Deputy Forest Research Institute
Jabalpur, Madhya Pradesh

21 SHRI A K SINGH
Divisional Forest Officer (T),
North Seoni, Seoni, Madhya Pradesh

22. SHRI ABHAYA KUMAR JAIN
Deputy Conservator of Forests (Wild Life)
Office of the Chief Conservator of Forests,
(Wild Life) Van Bhawan Tulsi Nagar
Bhopal, Madhya Pradesh

23 SHRI G RIDHARA RAO.
Divisional Forest Officer
North Betul Division (P),
Betul Madhya Pradesh

24. SHRI SURESH CHANDRA,
Conservator of Forests,
Narmada Valley Development Authority,
Narmada Bhawan, Bhopal, Madhya Pradesh.

25. SHRI KHAZAN SINGH,
Asst. Inspector-General of Forest,
Ministry of Environment and Forests,
Paryavaran Bhawan, C. G. O. Complex,
Lodhi Road, New Delhi.

26. SHRI T K RAGHAVAN NAIR,
Chief Conservator of Forests (Development)
Trivandrum, Kerala.

27. SHRI M. G. KUTTY,
Chief Conservator of Forests (Protection),
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